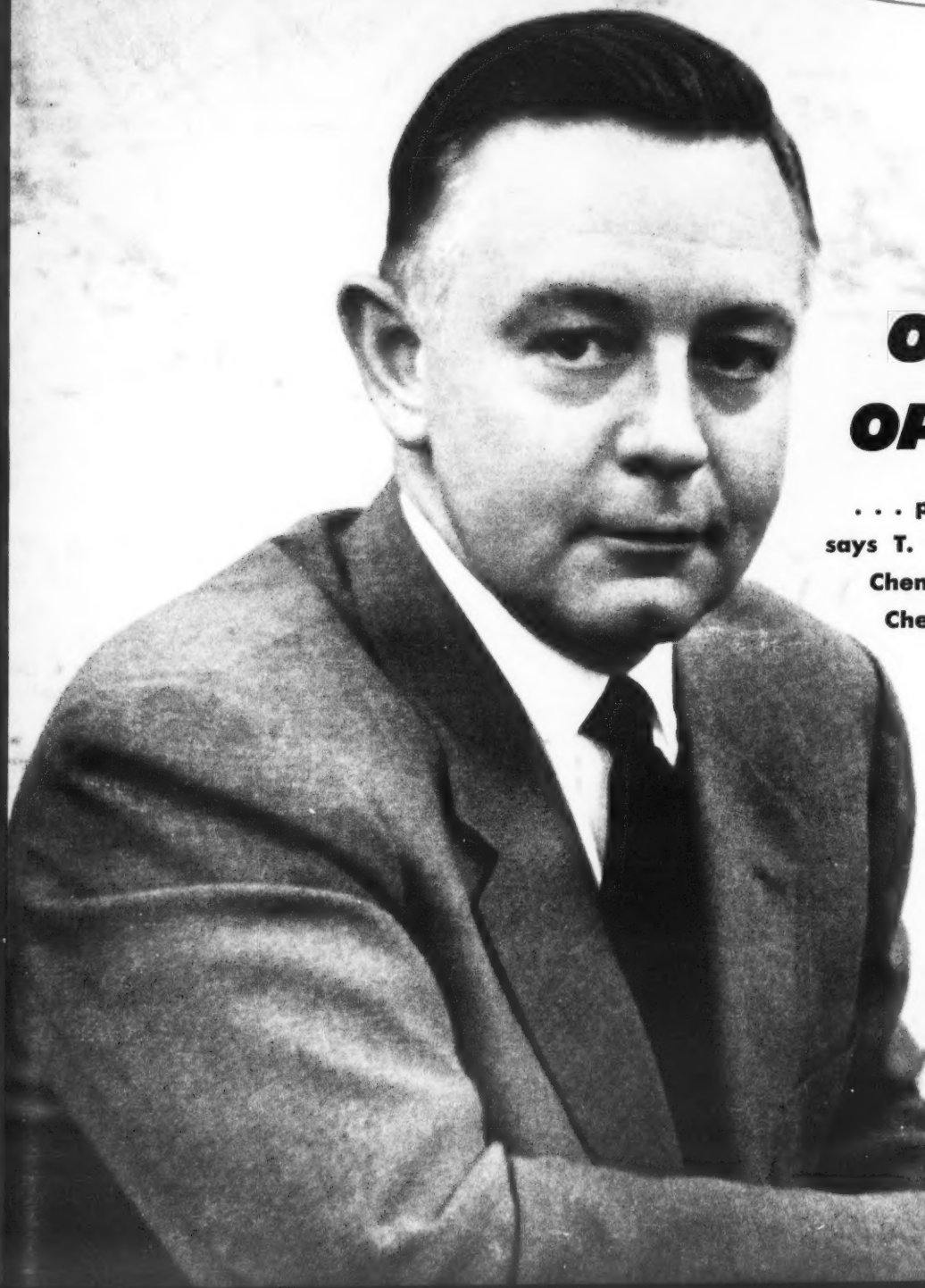
NOVEMBER 1958

CHEMICAL PROCESSING®



OVERSEAS OPPORTUNITY

. . . promising for U. S. chemicals, says T. G. Hughes, President of Oronite Chemical Company and California Chemical International.....**page 87**

THE WORLD

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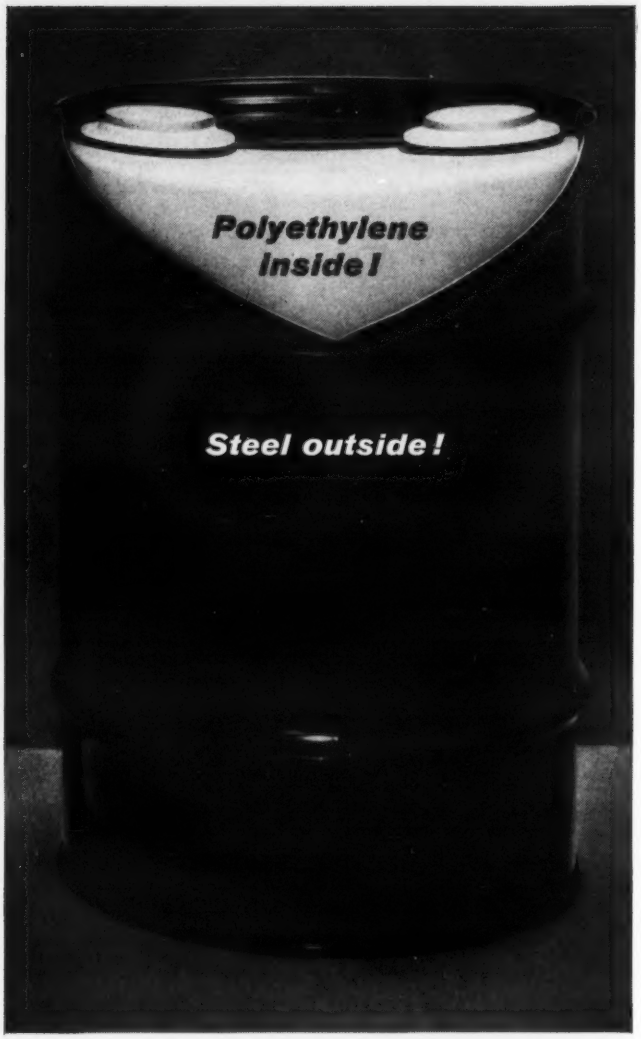
A Putman Publication
"Executive Magazines for Industry"

Now! From GENERAL CHEMICAL... *Leader in HF Production*

AQUEOUS HF IN NEW, SAFER "DRUM-WITHIN-A-DRUM"



Development of a safer container for Aqueous Hydrofluoric Acid (70% HF) has long been an important objective of chemical packaging specialists. Now General Chemical offers Aqueous HF in a new, safer "drum-within-a-drum" which combines the advantages of polyethylene and steel. Developed after more than two years of testing, this drum offers many important features:

Requires no venting! The new drum entirely eliminates venting, since there is no acid-to-steel contact. The all-steel drum presents possibility of danger from hydrogen pressure unless venting is done frequently and regularly.

No corrosion or leakage! One-piece polyethylene construction of inner drum cannot corrode or leak even during long periods of storage. The HF-resistant "poly" drum is fixed firmly inside its steel overpack.

Polyethylene closure seals tightly without "freezing"! Both bung opening and plug are acid-resistant polyethylene. The specially-constructed closure is exceptionally tight, yet simple to operate . . . eliminates "frozen" closures.

Lower tare weight! The new drum is much lighter than the all-steel container. The 30-gallon size, for example, carries 260 pounds of 70% HF with tare weight of only 40 pounds.

General Chemical is the nation's leading producer of hydrofluoric acid. Producing Works are located at Baton Rouge, La.; North Claymont, Del.; and Nitro, W. Va. Additional packaging locations at Buffalo, Chicago, Cleveland, Pittsburgh, and El Segundo (Calif.)

Telephone or write your nearest General Chemical office listed below for further information or service.

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Check 2120 opposite last page

conventions and exhibits

November 7. Salesman's Association of the American Chemical Industry, Annual Dinner Dance, Waldorf-Astoria, New York.

November 10-12. Atomic Industrial Forum, Annual Conference, Shoreham Hotel, Washington, D. C.

November 10-13. American Petroleum Institute, 38th Annual Meeting, Conrad Hilton, Palmer House and Congress Hotels, Chicago.

November 12. Synthetic Organic Chemical Manufacturers Association, luncheon meeting, Hotel Roosevelt, New York.

November 12-13. Chemical Market Research Association, Fall Meeting, St. Paul Hotel, St. Paul, Minnesota.

November 17-19. National Association of Corrosion Engineers, Annual Conference, Western Region, Statler Hotel, Los Angeles.

November 17-21. Eighth National Plastics Exposition, Society of the Plastics Industry. Inc., International Amphitheatre, Chicago.

November 20-21. Commercial Chemical Development Association, joint with National Agricultural Chemicals Association, Lord Baltimore Hotel, Baltimore, and Beltsville Research Center, USDA, Beltsville, Maryland.

November 25. Manufacturing Chemists' Assn., Eighth Semi-annual Meeting and Winter Conference, Hotel Statler, New York.

November 30-*December* 5. The American Society of Mechanical Engineers, Annual Meeting, Statler & Sheraton-McAlpin Hotels, New York.

December 1-3. American Society of Refrigerating Engineers, Semi-annual Meeting, Hotel Roosevelt, New Orleans.

December 1-5. 23rd National Exposition of Power and Mechanical Engineering, The American Society of Mechanical Engineers, Coliseum, New York.

. . . Meetings and shows of interest to the chemical industries

December 7. Salesman's Association of the American Chemical Industry, Christmas Party, Waldorf-Astoria, New York.

December 7-10. American Institute of Chemical Engineers, Annual Meeting, Netherland Plaza Hotel, Cincinnati, Ohio.

December 9-11. Chemical Specialties Manufacturers Association, 45th Annual Meeting, Commodore Hotel, New York.

January 26-29. Fourteenth International Heating & Air-Conditioning Exposition, Convention Hall, Philadelphia.

January 26-29. Plant Maintenance and Engineering Show, Public Auditorium, Cleveland.

January 28-30. Society of Plastics Engineers, Inc., 15th Annual Technical Conference, Commodore Hotel, New York.

February 3-5. The Society of the Plastics Industry, Inc., 14th Reinforced Plastics Division Conference, Edgewater Beach Hotel, Chicago.

March 2. Louisville Federation of Paint & Varnish Production Clubs, Annual Symposium, Sheraton Hotel, Louisville, Ky.

March 2-6. Tenth Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Penn-Sheraton Hotel, Pittsburgh.

March 16-20. American Institute of Chemical Engineers, Nat'l. Meeting, Chalfonte Haddon Hall, Atlantic City.

March 16-20. National Association of Corrosion Engineers, National Meeting, Sherman Hotel, Chicago.

April 5-10. American Chemical Society, 135th National Meeting, Boston.

April 5-10. International Atomic Exposition, Public Auditorium, Cleveland.

April 20-22. The American Oil Chemists' Society, Spring Meeting, Roosevelt Hotel, New Orleans.

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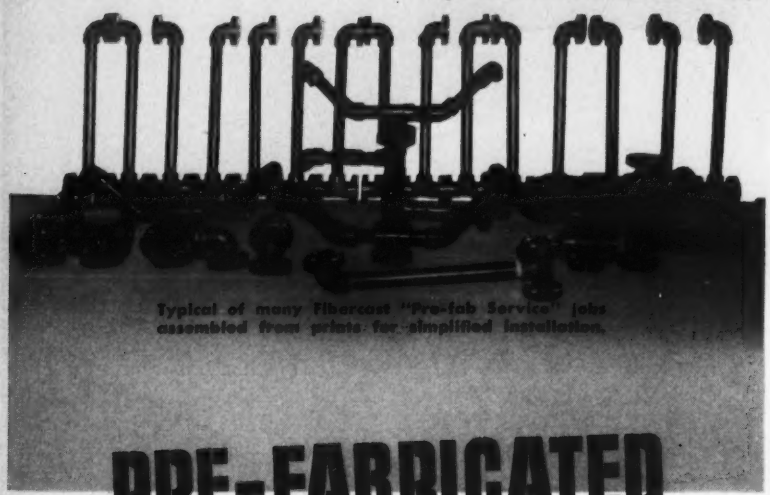

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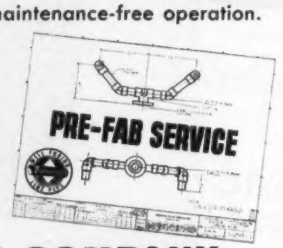

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CHEMICAL PROCESSING

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and Chemical Business

For the management team

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Vol. 21 November 1958 No. 11

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Editorial Staff—page 6
Advertising Representatives—page 225

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over the editor's shoulder

Plastics Industry (w)hooping it up

Those polyethylene hoops that have been spinning around 15 million or so swinging and swaying hips the past few months typify, in a rather uninhibited manner, the free-swinging growth of the plastics industry. But whereas the hoops may be a shortlived novelty, the plastics industry is definitely here to stay.

Although comparatively an upstart as industries go, it has effectively demonstrated that it is one of the fastest growing, and has one of the best potentials for future growth, of any U. S. industry.

Practically every day in some way plastics are doing more jobs as well as, or better than, competitive materials and methods. And most important in these times of cost consciousness: plastics are doing these jobs at lower cost while maintaining the highest standards of quality.

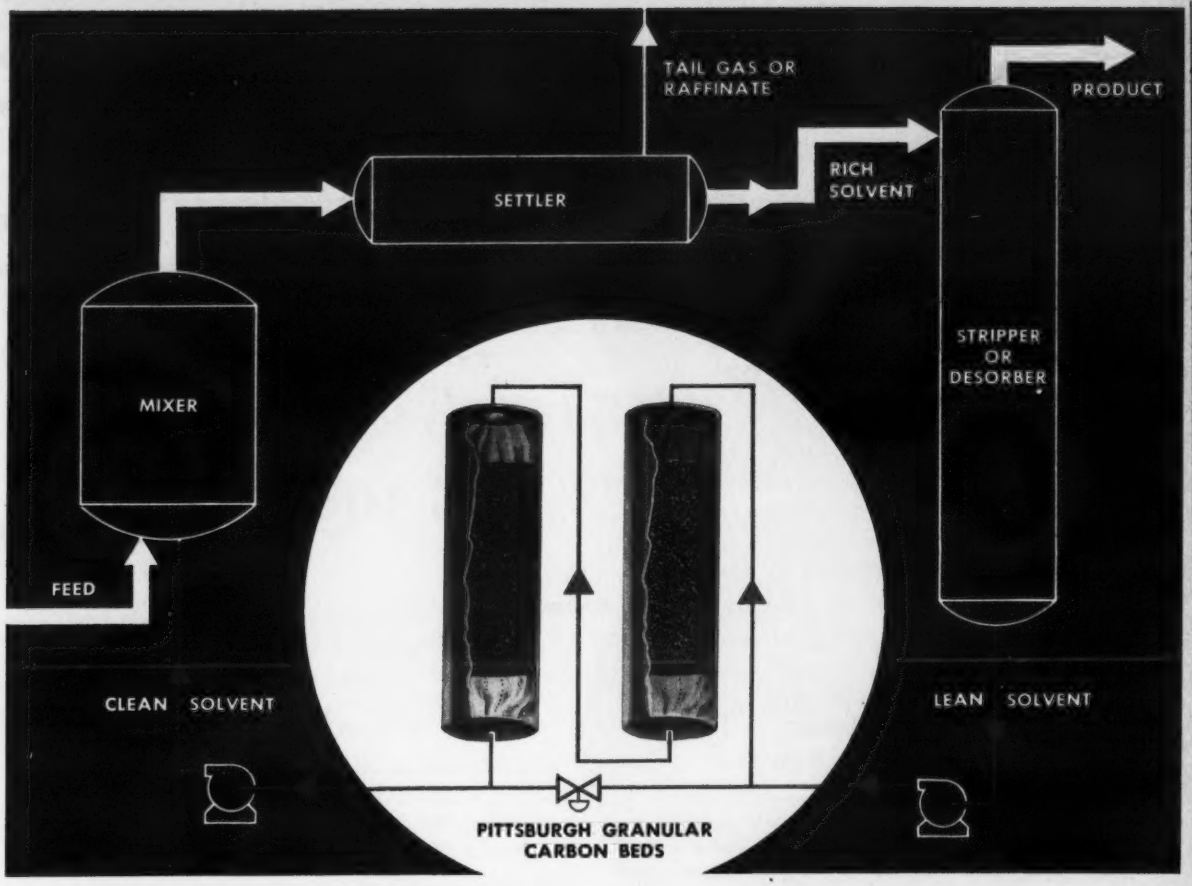
This is graphically illustrated in the "Plastics for Profits" theme of the Eighth National Plastics Exposition being held at the International Amphitheatre, Chicago, Nov. 17-21. The plastics show is a feature of this issue, beginning on page 36. You'll also find other feature articles about plastics and their applications on pages 67, 141, 144.

In fact, every issue of CP carries stories on trends in the plastics industry, new applications of plastics to solve processing problems, and new plastic products and materials.

Through such coverage, CP enables you to keep track of this fast-moving segment of the chemical processing industry — the ever-widening orbit of plastics.

John C. Stevens

Assistant Editor



Improve Solvent Extraction and Absorption Efficiency with PITTSBURGH ACTIVATED CARBON

Does your process utilize acids, alkalies, amines, glycols or other costly solvents which must be recirculated for repeated use? If so, you can maintain higher solvent selectivity and efficiency, and eliminate sewering a side stream by circulating the solvent through a bed of PITTSBURGH Granular Activated Carbon.

In butadiene manufacture, for example, PITTSBURGH Activated Carbon is used to reduce the accumulation of organic contaminants in a recirculating stream of cuprous ammonium acetate.

In the same manner, recirculating streams of amines used in gas purification are kept free of contamination with PITTSBURGH Granular Carbon. Often, it is only necessary to carbon treat *a portion* of the solvent stream to remove accumulated organic contaminants.

Use of PITTSBURGH Activated Carbon in this manner results in:

1. **Increased selectivity and capacity of the solvent.**
2. **Reduced solvent make-up or cost of reclaiming.**
3. **Elimination of foaming in evaporators or distillation towers.**
4. **Reduction of corrosion and maintenance.**
5. **Improvement of quality of end product.**

Our technical representatives will be glad to evaluate and advise whether or not such improvements are possible in your system. • *Write today for more information . . . or a visit from a* PITTSBURGH *technical representative.*

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Describes types and various applications of PITTSBURGH Activated Carbons in both liquid and vapor phase adsorption. For your free copy, write to Dept.C.

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highlights

CHEMICAL PROCESSING.

NOVEMBER 1958

VOLUME 21 • NUMBER 11

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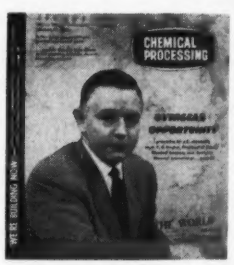
THIS MONTH'S COVER

T. G. (Jerry) Hughes, president of Oronite Chemical Company and California Chemical International, Inc., is shown in front of a map of the world, symbolizing world-wide activities of these companies. In article on page 87, Mr. Hughes discusses the favorable experience of Oronite in foreign trade, pointing out the opportunity overseas afforded to the petrochemical producer.



REGULAR FEATURES

SPECIAL READER SERVICES

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Team research

Dear Sir:

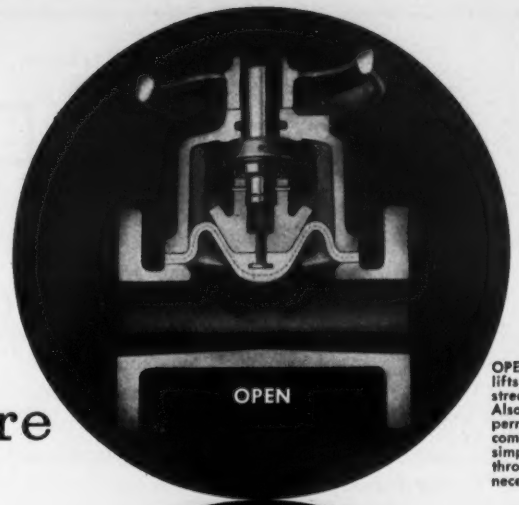
Though few can doubt the rectitude of Kroll's indictment of 'team research' and the current emphasis on collective conformity (June CP, page 29), one must realize that the problem is not new, but rather an old problem recently brought into a new focus by the burgeoning organization of research effort in this country. There have always been casuists — I use this term in its purest sense — who have pointed out the hypocrisy which inheres in the saying of one thing and then doing another.

Fortunately, in the past such hypocrisy has been favored by a society, and the progress of the arts, sciences, and technology has not suffered serious set-backs. True enough, there are individual instances where it has had disastrous consequences but no one appears to recognize the enormity of the calamity even today.

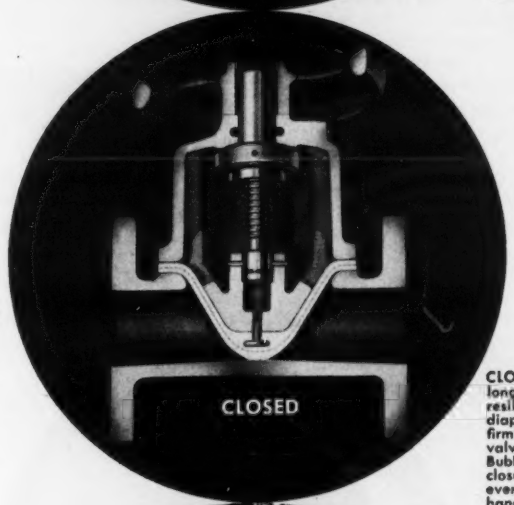
A striking example is the stupidity of the 19th-century British government in not supporting research on building Charles Babbage's Analytical Engine. In the name of balancing the budget, the Peel government managed to put a brake on the development of science that has been released only in the past two decades. Clearly, had Babbage's engine been completed and put in operation, the course of certainly British science and probably world science would have been altered and put ahead by half a century. Such footless speculations, however, do not change the hypotaxis of history, and it is known that the world managed to get along without the Babbage engine fairly well.

One must agree that no matter how well organized a team might be, the individual still does the inventing; that is, the individual must have the *idea* before the invention can be put in material form. No matter how difficult the scheme of organization is, a truly creative individual can still make his discovery and

Maximum flow, minimum turbulence, negligible pressure drop!



OPEN Diaphragm lifts high for streamline flow. Also, valve design permits comparatively simple rodding through, when necessary.



CLOSED Despite long usage, resilient diaphragm seals firmly against valve body. Bubble-tight closure is assured, even when handling gritty or fibrous materials.

GRINNELL-SAUNDERS STRAIGHTWAY DIAPHRAGM VALVES* are unsurpassed for handling viscous materials — semifluid foods, latex, magmas; solids in suspension — slurries, pulp stock, sludges; fluid-borne abrasives; corrosive chemicals.

The straight-through design eliminates pockets, gate trenches and other obstructions which can trap solids. The result is maximum flow, minimum turbulence, and negligible pressure drop for a diaphragm valve.

The straight-through design also has the advantage of causing very little basic change in the direction of the fluid stream, thus reducing abrasive action from high velocity particles.

These advantages are in addition, of course, to benefits normally associated with the use of diaphragm valves . . . such as freedom from corrosion and clogging of working parts, since these are completely sealed off by the diaphragm; prevention of product contamination; elimination of stem leakage and routine maintenance, because there are no packing glands. Also, when properly pitched, lines are self-draining.

Grinnell-Saunders Straightway Diaphragm Valves are available in a choice of body sizes and materials, linings and diaphragms. Handwheel or power operated. For complete information, write Grinnell Company, Inc., 277 West Exchange St., Prov. 1, R. I.

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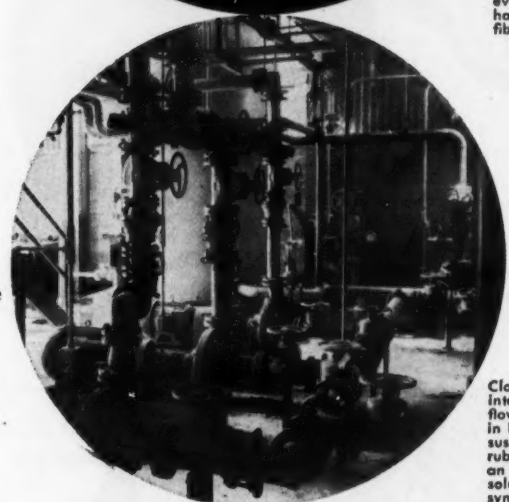

Clogging and interruption to flow is prevented in lines handling a suspension of rubber particles in an acid brine solution at this synthetic rubber plant.

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Finding the right location for a new plant is not a problem of land availabilities alone. It is complicated by many other factors—natural resources, labor, power, taxes, zoning laws, community facilities—a thousand and one details.

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To secure accurate advice in these fields North Western taps the resources of its *entire organization.* That's why we can supply information on any subject from sewer lines to school facilities and *guarantee* the accuracy of the details.

North Western offers a complete and comprehensive Industrial Site Service. Here are some of the things we do (there are many more):

- Analyze topography, soil and water conditions
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Check 2125 opposite last page

usually put it into practice.

In doing so, he must make concessions to the organized team, but the remainder of the team soon realizes which individual is the essence of their collective creativity and goes to some effort appeasing his tastes. After a while — notwithstanding the organization chart — the individual with creative ability has reorganized the research team into a collection of his assistants and technicians. Whether this be good or not is a question for moral philosophers; operationally, it functions.

Kroll has done a service to science in pointing out that 'team research' *per se* does not exist, and that whatever means necessary to bring the truly creative person into a satisfactory equilibrium with his 'team' should be and ought to be done as quickly as possible.

FRANK S. WAGNER JR.

Technical Librarian
Chemical Division
Celanese Corporation of America
Clarkwood, Texas

We agree fully. Reader Wagner will be much interested in E. M. Kipp's article on this subject in next month's CP.

"Why don't you go out and get some business so we can hire another secretary!"

Submerged exhaust

Dear Mr. Vaaler:

We were very pleased to note (October CP, page 15) that Mr. Weisman recognized the basic difference in configuration in the manner in which the burner is fired in the waste concentration equipment described in the subject article.

The arrangement used with our equipment has the burner mounted above the surface of the liquid being heated, and only the products of combustion reach beneath the surface, where they are discharged and allowed to bubble through the liquid. Thus, we usually refer to our arrangement as a submerged exhaust type of system rather than truly a submerged combustion system. Our experience has shown that the performance results are excellent with this arrangement.

We freely admit to frequently using the word 'submerged combustion' in our description and discussions of this type of heating, but the proper description should be 'submerged exhaust' rather than 'submerged combustion'.

W. K. LOMBARD
Vice President &
Sales Manager

Thermal Research
& Engineering Corporation
Conshohocken, Pa

'Rational Idealism'

Dear Sir:

I read Dr. G. J. Martin's interesting article on "Creativity and Survival" in a recent issue of CHEMICAL PROCESSING.

His plaint is that our standard of creativity is lower than that in Europe, and that unless we raise it our survival may be at stake. I do not share Dr. Martin's fear of our comparative ability to survive: Our standard of living and surviving is higher than what is found in Europe.

Using "creativity" in the scientific sense, there is a sharp difference between so-

Progress Report...

An ancient medication gets modern improvements

For more than a hundred years, therapeutic suppositories have been formulated with cocoa butter. Recently, however, CARBIDE's CARBOWAX polyethylene glycols have been tested for this purpose and found to have numerous advantages over the traditional type of base.

CARBOWAX polyethylene glycols are compatible with a large number of drugs administered in suppository form. Formulations with various rates of disintegration are possible with CARBOWAX polyethylene glycols. A wide range of melting points and solubilities is possible by varying the ratio of low to high molecular weight polyethylene glycols in the formula.

Other advantages of CARBOWAX polyethylene glycol bases, of special interest to the compounder, are their relatively short congealing time, their ease of removal from the mold, their compatibility with substances often difficult to formulate, and their ability to give the suppository a good appearance.

The table below lists melting points and solubilities of certain CARBOWAX polyethylene glycol compounds.

Hexanetriol-1,2,6, a relatively new chemical, is an excellent plasticizing agent for CARBOWAX compounds. A detailed report on CARBOWAX polyethylene glycol suppository bases was published in the March, 1957 "American Professional Pharmacist." Reprints of this comprehensive article are available. Please check the coupon for a copy.

Hot-spray lacquer coatings

An increasingly popular method of spray coating is the use of hot-spray lacquers. Since heat, rather than additional solvents, is used to thin the lacquer, the solvent system becomes critical in the formulation.

Fewer coats of hot-spray lacquers are needed because of the higher solids content. Hot-spraying also improves flowout . . . minimizes blushing . . . and increases the resistance of the finish to checking and peeling.

Experience has proved that medium and high boiling point solvents offer the best performance in hot-spray application. CELLOSOLVE solvent, CELLOSOLVE acetate, and butyl CELLOSOLVE fill the bill. *And,* by selectively blending these solvents with CARBIDE's methyl isobutyl ketone or n-butyl acetate, you can vary the drying time to fit your production schedule.

For help in choosing the proper solvents, send for the handy 6-page "Solvent Selector" which gives complete, unbiased data on 70 compounds. Just check the coupon.

Ethanolamines "down on the farm"

CARBIDE's alkanolamines and their derivatives have many useful applications in agricultural chemicals for farmers all over America.

Diethanolamine, triethanolamine and mixed isopropanolamine are efficient solubilizers for 2,4-D and similar herbicides. Agricultural sprays are composed of (phenylmercury) triethanolammonium lactate and (phenylmercury) monoethanolammonium acetate. Diethanolamides are useful as emulsifiers in various agricultural insecticidal concentrates. For more information check the coupon.

Tear out this coupon. Check the boxes on which you'd like more information, and mail to Dept. H, Union Carbide Chemicals Company, 30 East 42nd Street, New York 17, N. Y.

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☐ Solvent Selector. ☐ Ethanolamines

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"Carbowax," "Cellosolve" and "Union Carbide" are trade-marks of Union Carbide Corporation.

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SOLUBILITIES AND MELTING POINTS OF "CARBOWAX" POLYETHYLENE GLYCOL COMPOUNDS

AVERAGE MOL. WT.	200	300	400	600	1000	1500	1540	4000	6000
MELTING POINT °C.	−15	−15 to −8	4 to 8	20 to 25	37 to 40	38 to 41	43 to 46	53 to 56	60 to 63
SOLUBILITY IN WATER	100%	100%	100%	100%	70%	73%	70%	62%	50%

Hexanetriol-1,2,6: Melting Point −20°C., 100% water soluble.

Check 2126 opposite last page

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HEATING ELEMENTS

TUBULAR HEATERS
for Tanks, Kettles, Baths, Extruders

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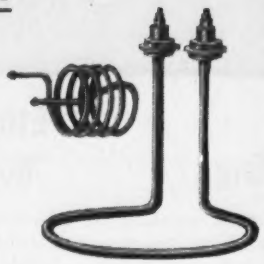
OIL & WATER IMMERSION HEATERS



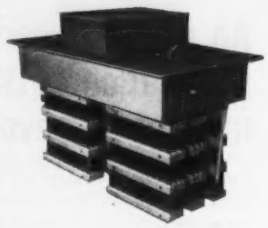
The Complete Line of TRENT Metal Sheathed Heating Elements Assure On-the-Spot Controlled Heat to Your Most Exacting Requirements. Write for Bulletin 74-TE.

"FOLDED-AND-FORMED" HEATING UNITS

Packaged Units for High Temperature Controlled Heating of Forced Air Installations.

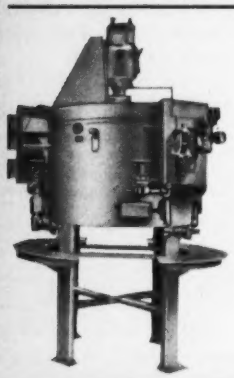
FFHP TYPE HEATING UNIT PLUG FEATURES

- TRENT "Folded-and-Formed" Heating Elements—greater radiating surface per square inch of cross section than any other electrical heating element!
- Maximum Frame Temperatures to 1350°F!
- Velocities up to 4000 Ft./Min.!
- Watt Densities from 10 to 30 Watts per Sq. Inch!
- 120, 240, 480 or 600V—3 Phase or Single Phase!
- Wired, Mounted, Insulated complete with Terminal Box—Ready for Installation!



TRENT "Folded-and-Formed" Racks and Plugs add up to *Faster* Heating and Cooling, Longer Element and Unit Life . . . Better Controlled Heat at Lower Cost! Write for Bulletin 102T.

KETTLES AND JACKETS



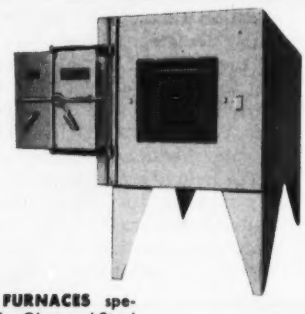
- 5 Gallon to 325 Gallon Capacity Kettles for Waxes, Oils, Resins, Salts, Asphalts.
- TRENT "Folded-and-Formed" Heating Elements in Metal Inner Liner.
- Complete Temperature Control to Prevent Overheating, Scorching, Hot Spotting.

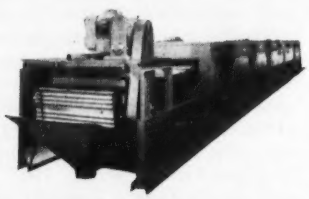
- Jackets for Retorts, Reactors and Autoclaves
- High Temperature Uniformity to 2000°F.
- Compact, Space Saving Design
- Low Thermal Inertia—High Dielectrical Strength (600V)
- Economical Installation and Maintenance
- Special "Folded-and-Formed" Roller Heaters Designed and Built to Your Specifications

Write for Bulletin 72-TE.

ELECTRIC FURNACES

BOX TYPE FURNACES for Hardening and Annealing Steel, Aluminum; Firing Ceramics; Processing Chemicals. Controlled Temperatures up to 2000°F.





CONVEYOR FURNACES for Glass Annealing, Baking Resistors, Ceramic Molding, Chemical Drying, Annealing Ferrous and Non-Ferrous Metals

- Controlled Heat up to 1850°F.!
- Designed and Built to Your Specifications!

Write for Bulletin 75-TC.

ANNEALING FURNACES specially designed for Glass and Steel applications in production and laboratory. Temperature range up to 1400°F.

Other TRENT Furnaces Designed for Uniform, Controlled Heat at Temperatures to 2700°F.

TRENT ENGINEERS will help you determine the most efficient and economical solution to your heating problems. Contact a Trent representative today!

TRENT INC. Electrically Heated Industrial Equipment
235 LEVERINGTON AVENUE, PHILADELPHIA 27, PA.
In Canada Supreme Power Supplies Limited, Toronto 14

Check 2127 opposite last page

LETTERS

cial and individual creation. The former has a practical function, the latter is self-motivated and of the highest rational standards.

Between them lies the difference between pragmatic and anti-pragmatic thinking. I have called the latter "Rational Idealism." If it is a matter of survival, the rational idealist has been in disfavor for a long time.

By my standard of "Rational Idealism," the pragmatically structured sciences such as psychology and economics and even the theories of evolution and relativity are not truly creative works. They lack a central rational structure with which their empiricisms can correlate. They are based on faulty postulation and they violate many of the rules of logic. They are, therefore, only expedients which will outlive their usefulness, for they cannot be equated with truth. I may cite Maxwell's Electromagnetic theory as an example of truly creative work.

HARRY MILLER
Treasurer
Pyrolac Corporation
Hawthorne, N. J.

New Jersey Industrial Directory—Electronic compilation was used to prepare 1958-59 edition of directory containing complete information on more than 14,000 firms. Listed are names and addresses of New Jersey firms, names of more than 34,000 personnel, products manufactured, number of employees, telephone numbers, population figures and other statistics. New format has alphabetical section, listing all firms in state.

Second listing is broken down by counties and municipalities, giving names and addresses of firms, products, names of officers with titles, and number of employees. A third listing is arranged alphabetically according to products manufactured or manufacturing services. To obtain 1958-59 edition of New Jersey Industrial Directory, remit $25 to New Jersey State Industrial Directory, Port Authority Bldg., 111 Eighth Ave., New York 11, N. Y.

Check 2127A opp. last page.

Watching Washington

Process Sales to Reds OK But — Get U.S. Advice on Deal First

Soviet Premier Nikita Krushchev has been reported as saying the Soviet Union is determined to build up its chemical industry quickly, and will outbid America to pay high wages to non-Communist technicians from the West.

U. S. chemical manufacturers are taking a dim view of Mr. Krushchev's remarks, particularly with regard to his plans for raiding this country's chemical processes. Spokesmen for the chemical industry have indicated they would like to see a "no sale" rung up on Mr. Krushchev's request. This is being taken in some quarters to mean the U.S. government has established an absolute closed-door policy on trade and data exchange with the Soviets.

This, however, is not so.

What individual chemical processors should do is exercise care in business dealings with the Soviets or other Iron Curtain countries. If one is approached by any Iron Curtain country, it is advisable to get Department of Commerce opinion before proceeding.

It is possible that older processes, more or less in public domain, could be sold without any over-all adverse effect. But to sell a new process—say in the plastics field—which a particular U. S. company has exclusively throws that company's secret into the Soviet's lap. Such an ill-considered arrangement could eventually upset the business picture not only industry-wise, but as it affects our entire economy and world trade and prices.

When a chemical process is sold behind the Iron Curtain, men must be sent there to explain what it is all about, how it must be operated and maintained. This drains, if only temporarily, the American market of its acknowledged short supply of technical manpower.

Russia's desire to catch up in the chemical field for the avowed purpose of using technology to benefit consumers is looked upon with suspicion by most observers here. If the U. S. did export know-how on certain of its consumer processes, it may not be too long before these processes could be turned to serve military aims, some observers believe.

In the wake of Mr. Krushchev's request, the Commerce Department announces modification of list of strategic restrictions on Soviet exports is being prepared. This control-easing results from recent U. S. commitment to NATO that the U. S. would do its part to expand East-West trade.

If controls are relaxed too much, Russia would get some of what it is looking for anyway. Indications here are that new regulations would not result in any substantial expansion of U. S.-Soviet trade. While the move is toward "net reduction" in control, it is expected there also will be additions to control list. Of interest to chemical processors is probable curbs on chemicals and electronic equipment, now strategic because of recent missile developments.

FDA amendment opens door to higher costs

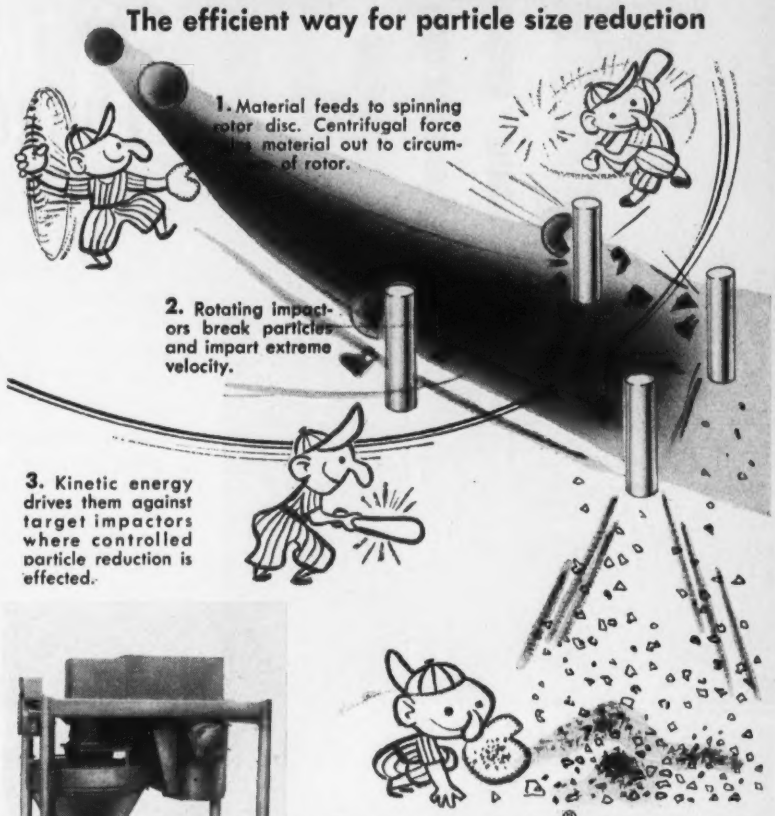
Now that the Food, Drug, and Cosmetic Act of 1938 has been amended to include food additive regulation, chemical processors can plan to increase expenditures for research and manpower.

With advent of "licensing," companies must make provi-

Get in on the

IMPACT

The efficient way for particle size reduction



APPLICATION:

Freeing *POLYETHYLENE* pellets from clustered mass without mutilation or temperature rise.

Entoleter Centrifugal Machines (Series 27 shown above) handle processing of entire output of Polyethylene Pellets for one of the country's largest producers.

Low cost, low power requirements and high capacities plus precise control of result make impact mills ideal for many chemical processing applications.

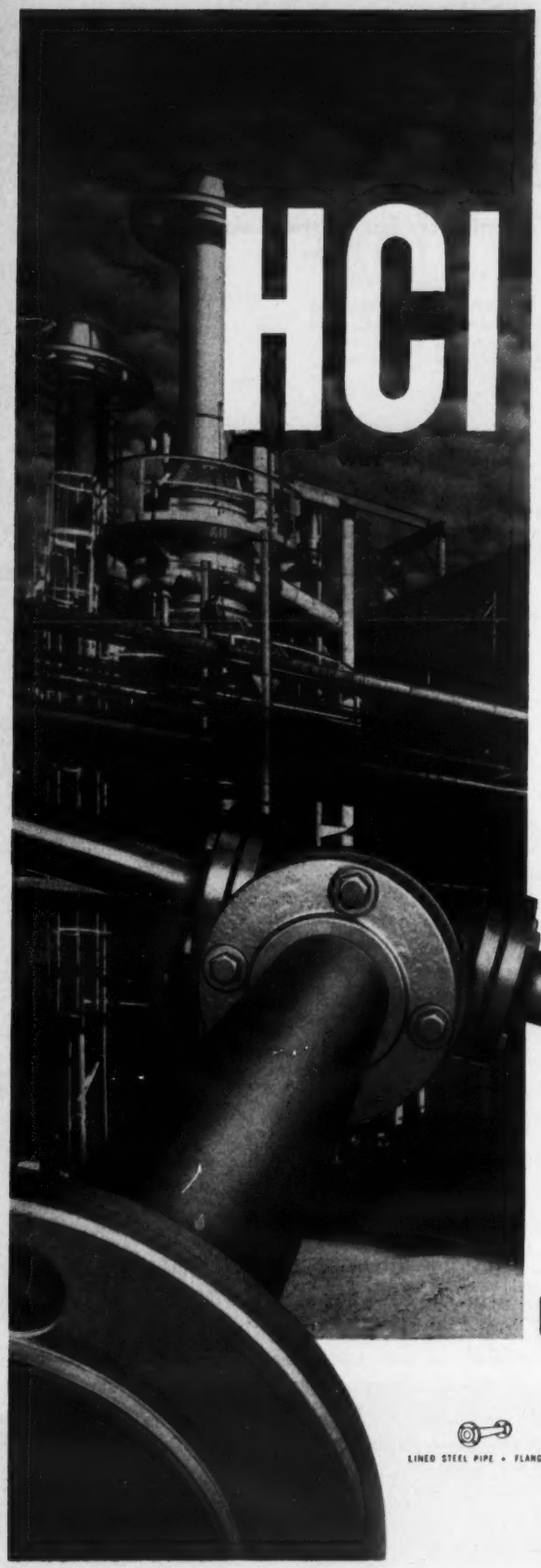
HERE'S WHY THE ENTOLETER® IMPACT MILL DOES A BETTER GRINDING OR MIXING JOB!

- Initial cost, operating cost and Maintenance cost are *lowest* of any production grinding method.
- Handles many times the capacity per horsepower — wet or dry.
- Controlled particle size reduction is achieved without screens, cutters, attrition or close grinding tolerances.
- Operates with low temperature rise — ideal for heat sensitive materials.

Get the full story on **IMPACT**—catalogs, data sheets, typical applications

***FREE** test runs of your materials.*

Check 2128 opposite last page



hydrochloric acid—to 500°F,

in any concentration,

CAN'T CORRODE FLUOROFLEX®-T PIPE

Lining is completely inert to all corrosives. It's made of Fluoroflex-T, a high density, non-porous compound* of virgin Teflon.

Liner and housing are in thermal equilibrium through an exclusive process developed by Resistoflex. It compensates for thermal expansion differential between the Teflon and the pipe housing, eliminating fatigue collapse, and cracking at the flange.

Saves $60,000 monthly at one chemical processing plant. Frequent piping failures cost that much in excessive maintenance and product loss. An exhaustive search among all types of piping uncovered only one system that could handle the mixture of 25% hydrochloric acid and organic solvents at 300°F and 100 psi without difficulty – Fluoroflex-T Type S piping. With over 1500 feet and 400 fittings now in service—some for more than 18 months—there have been *no failures.*

Fluoroflex-T Type S piping systems can handle the toughest problems of corrosion, erosion and contamination for you, too, with complete safety. Send for Bulletin TS-1A. Dept. 149, RESISTOFLEX CORPORATION, Roseland, N. J. Other Plants: Burbank, Cal., Dallas, Tex.

® Fluoroflex is a Resistoflex trademark, reg., U. S. pat. off.
® Teflon is DuPont's trademark for TFE fluorocarbon resins

** Pat. No. 2,752,637*

liner of TEFLON®
in thermal equilibrium with housing

RESISTOFLEX

Complete systems for corrosive service

LINED STEEL PIPE • FLANGED FLEXIBLE HOSE • BELLOWS • ELBOWS • TEES • REDUCERS • DIP PIPES & SPARGERS • LAMINATED PIPE

Check 2129 opposite last page

sions for giving FDA research data it requires, as well as providing themselves with manpower necessary for adequate liaison with that agency.

FDA itself has not lost time in moving along on new Food Additives Amendment.

Under its provisions, chemical processors who have developed new food additives must test them, submit test results to FDA, and await its ruling on use.

(*FDA told* CHEMICAL PROCESSING *that chemical makers who want information about testing procedures should write to the food protection committee of National Research Council in Washington and ask for pamphlet entitled "Principles and Procedures for Evaluating the Safety of Intentional Chemical Additives in Food."*)

If FDA is satisfied safety has been established under proposed conditions of use, it will issue a regulation specifying amount which may be used, foods in which it may be used, and other necessary conditions of use.

Chemical processors who have established the safety of additives then have a "tolerance" for it. From then on, any manufacturer who wants to use it within tolerance set has FDA go-ahead.

In effect, this removes unnecessary restrictions on many useful chemicals and should open the door to further advances in food technology.

If FDA Says 'No'

What happens if FDA is not satisfied an additive is safe? Its use will not be permitted, but processor affected by such an order is entitled to public hearing. Any order issued after such hearing will then be subject to court review. Under new amendment, an order will be sustained "if based upon a fair evaluation of the entire record."

Test data must be submitted within 16 months on substances in use prior to January 1, 1958. Exempt from this particular requirement are common additives such as salt, sugar, vinegar, and oth-

ers generally recognized by experts as safe.

As a first step in its initial regulatory action, FDA is compiling a list of these foods. Actually more than a list, regulation will link specific additives with specific uses. This will not mean a blanket exemption for additives listed.

FDA is ready immediately to discuss status of any additive with chemical processors involved. If they have new additive in the works, they can petition FDA requesting a tolerance as soon as they are ready.

Petition must contain information regarding additional composition, condition of proposed use, intended effect on foods, methods of analysis, and full reports of investigations made with respect to safety.

Use of lighter gage 55-gal drums OKd

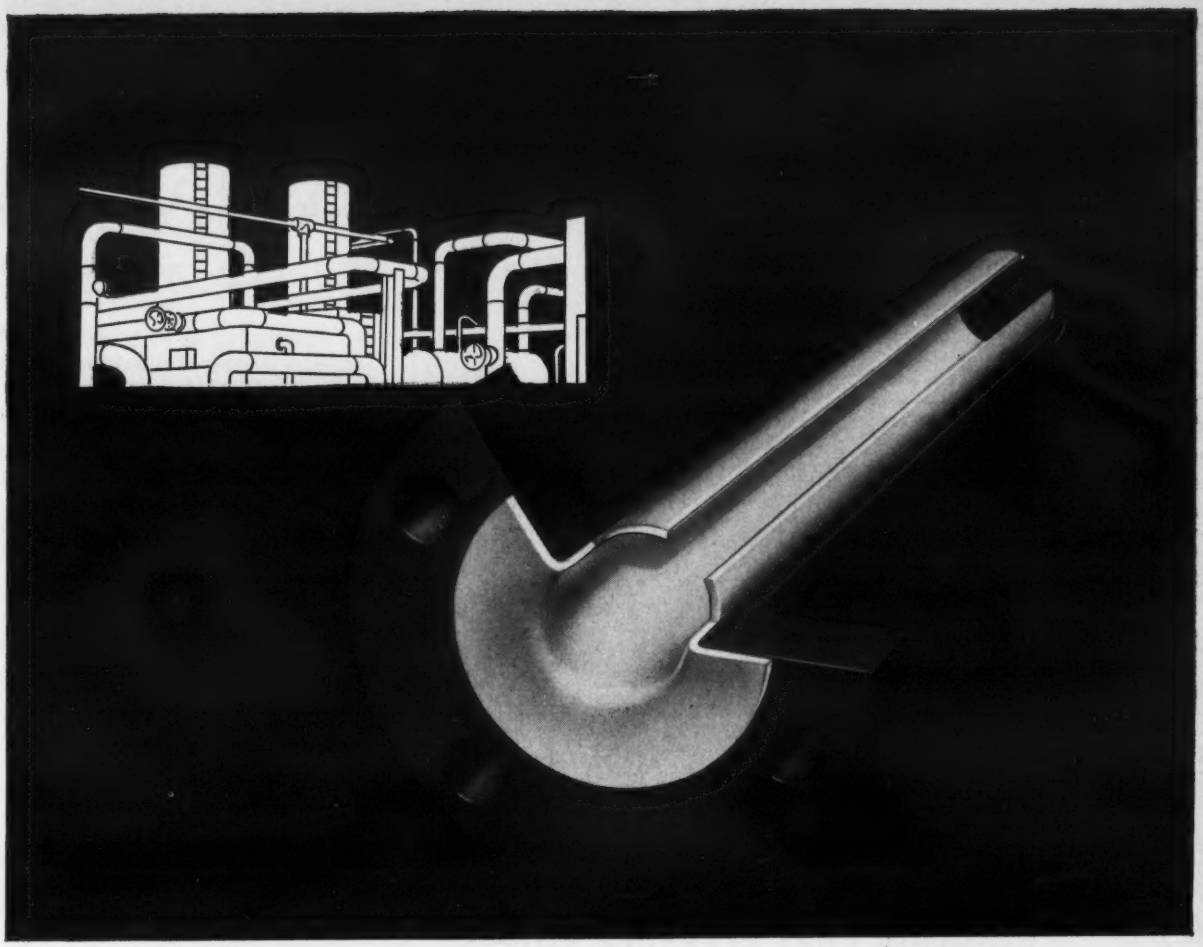
Next month, chemical processors may start using—and reusing—lighter gage 55-gallon steel drums for motor carrier transport.

This results from concerted action by Manufacturing Chemists' Association packaging committee and Steel Shipping Container Institute. They convinced National Classification Board that leakage problem once associated with lighter drums had been all but eliminated by manufacturing improvements.

Steel drums with 20-gage walls and 18-gage heads now can replace the 18-18-gage drums formerly required.

School fund hike seen

Secretary of Health, Education and Welfare Arthur Flemming is disappointed in the $40-million Congressional appropriation for aid to education. He'll ask new Congress for more money to finance science, mathematics, and foreign language courses in primary and secondary schools.



Pipe lined with a TFE-fluorocarbon resin eliminates costly replacements and maintenance

Pipe lined with a TEFLON TFE-fluorocarbon resin can save you money by substantially reducing process shutdown, pipe replacement and system maintenance. It will increase plant safety by eliminating the hazard of corrosion-caused leaks and disassembly of chemical lines.

TFE-fluorocarbon resins withstand the most corrosive chemicals used in the industry. For example, sections of this lined pipe were installed in an aqueous process stream carrying HCl liquid and vapor, plus organic solvents and reagents at temperatures above 220°F! After more than two years, inspection showed their condition to be so good that they were reinstalled under even more severe conditions. Because of this outstanding performance, the plant has greatly extended the use of TFE-lined pipe.

TFE-fluorocarbon pipe liner has many other advantages. It is rated for use up to 500°F. It won't shatter under vibration or physical or thermal shock, like brittle lining. The non-adhesive properties of TFE resins make them ideal for handling sticky or viscous substances. The liner flared over the flanges provides complete protection for the metal from the process fluids and eliminates the need for additional gasketing. And now you can get a complete assortment of standard sizes, flanged pipe, tees, elbows and reducers, all lined with TEFLON TFE resins.

For long service life, greatly reduced maintenance and downtime, and greatly increased plant safety, install pipe lined with TEFLON. Call your local pipe supplier for the details. Or, for more information, write to: **E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Room 911, Du Pont Building, Wilmington 98, Delaware.**

IN CANADA: Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec.

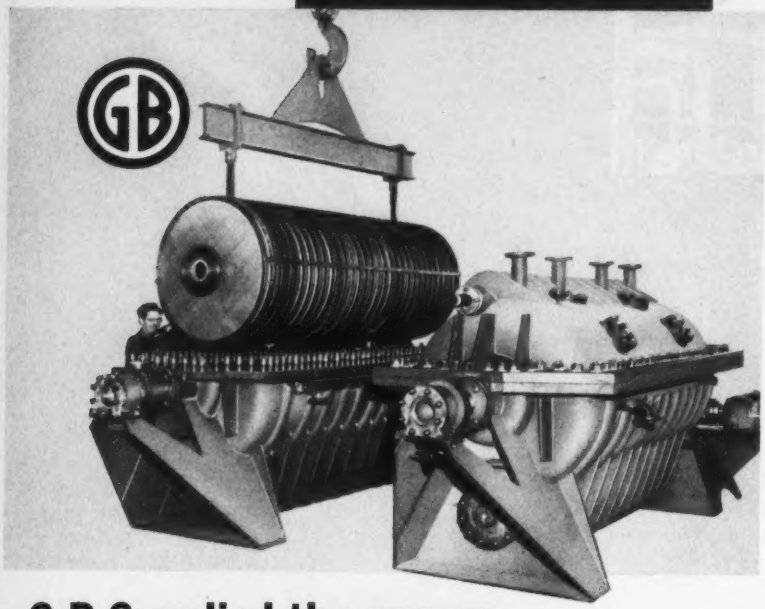
DU PONT REG. U.S. PAT. OFF. **TEFLON®** TFE-FLUOROCARBON RESINS

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

TEFLON is Du Pont's registered trademark for its fluorocarbon resins, including the TFE (tetrafluoroethylene) resins discussed herein.

Check 2130 opposite last page

The problem: How to handle a hot inflammable liquid under high pressure safely



G-B Supplied the answer with these large Vallez Rotating Leaf Pressure Filters

These large Vallez Rotating Leaf Pressure Filters were designed especially for the new Phillips Chemical Company polyethylene plant at Adams Terminal, Texas.

These filters are supplied with a special steam jacket to keep the contents hot and are designed to operate at 160 psig. Special emphasis was given throughout the designing and fabrication of these filters to handle a hot inflammable liquid under high pressure safely. This is typical of G-B engineering know-how.

G-B Engineers are at your service to discuss your processing problems without cost or obligation.

GOSLIN-BIRMINGHAM
MANUFACTURING CO., INC.
BIRMINGHAM, ALABAMA

FILTERS • EVAPORATORS
PROCESS EQUIPMENT
CONTRACT MANUFACTURING
including HEAVY CASTINGS

Check 2131 opposite last page

Du Pont, GM Stock Disposition —A Long Way to Go Yet

WILLIAM R. WHITE, Market Analyst
Hornblower & Weeks

Climax of an historic corporate legal battle — as significant as that leading to dissolution of the Standard Oil "trust" a half century ago — directs attention to two industrial giants of the present era, E. I. du Pont de Nemours & Co., and General Motors Corporation.

Government authorities have been endeavoring for a decade to compel the big chemical company to disassociate itself from the nation's largest automobile producer. The business world has evinced concern over possible disturbing consequences of an enforced distribution of Du Pont's 23 percent stock interest in General Motors.

The Supreme Court upheld the Justice Department's argument that retention by Du Pont of its GM holdings violated provisions of the Clayton Act. The high court refrained, however, from ordering Du Pont actually to dispose of its 63 million GM shares. Instead, it referred the case to the lower court for formulating an equitable solution.

The Justice Department, in October, 1957, filed a plan with the Federal District Court in Chicago calling for compulsory disposition by Du Pont of its GM shares over a period of 10 years. About two-thirds would be by distribution to Du Pont stockholders and remainder by sale for account of certain stockholders. The Internal Revenue Service held that shares so distributed would be taxable to recipients as ordinary income.

This seemed to make it inevitable that the Government plan would result in heavy sales of Du Pont shares to avoid receipt of additional income or of GM shares to meet heavy tax liabilities. Many have contended that extensive liquidation could have a seriously adverse effect on quotations for both Du Pont and General Motors and might depress share prices generally.

The district judge appointed eminent counsel as amici curiae, first to consider the problem from the point of view of Du Pont stockholders and secondly from the viewpoint of General Motors stockholders. Counsel acting for Du Pont holders reported to the court early in August. He recommended as fair and reasonable that Du Pont be permitted to retain its GM shares but that voting rights thereon be transferred pro rata to holders of Du Pont common stock.

He made the further suggestion that such voting rights which would thereby accrue to Christiana Securities Company and Delaware Realty & Insurance Company, which together own nearly 30 percent of Du Pont's stock, be transferred in turn to Christiana and Delaware stockholders.

He further recommended that no director, officer, nor employee of Du Pont, Christiana, or Delaware be permitted to hold similar positions in GM. He argued that outright divestiture by Du Pont was not required by the decision, but that if the district judge felt otherwise, at least any decision requiring divestiture should be delayed to observe outcome of legislative efforts to exempt a court-ordered stock distribution from being treated as ordinary income.

Counsel acting for GM stockholders filed his report several weeks later with similar suggestions for shifting voting power without shifting ownership of shares from Du Pont. His proposal would sterilize votes that otherwise might go to persons who were officers or directors of Du Pont, Christiana, or Delaware.

Inasmuch as either the corporation or the Justice Department has right of appeal from lower court findings, for reconsideration by the Supreme Court, it is possible that settlement of the litigation may be prolonged for many months.

(For further information on chemical stocks write Hornblower & Weeks, 40 Wall Street, New York 5, N.Y. or check 2133 opposite last page.)

Spotlight On People

LEON W. MILLER becomes director of chemical sales in Allied Chemical's Plastics and Coal Chemicals Division. JAMES E. SHAND and JOHN C. ESHER are, respectively, new manager and assistant manager of chemical sales in the division.

PAUL E. HILL and HAROLD J. MICHEL elected vice presidents of American Viscose Corporation.

Changes at Diamond Alkali Company: WILLIAM H. MCCONNELL is vice president—marketing; HENRY B. CLARK, director of sales; JOHN W. MANTZ, general manager of Soda Products Division; and SAMUEL S. SAVAGE, general manager of new International Division.

GEORGE F. POLZER elected executive vice president and director of Ultra Chemical Works, Inc., division of Witco Chemical Company, Inc.

New general manager of The Texas Company's Petrochemical Department is M. F. GRANVILLE.

THOMAS E. MOFFITT becomes president of Hooker Chemicals Limited; F. LEONARD BRYANT and HORACE W. HOOKER JR. become vice presidents. All are connected with parent U. S. firm, Hooker Chemical Corporation — Mr. Moffitt as president, Mr. Bryant as vice president — production, and Mr. Hooker as western sales manager.

To next page

CPH-4

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for use as
Emulsifier
Anti-foamer
Carrier
Solvent
Wetting Agent
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for use in production of
Paper
Cosmetics
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check these features
- Aniomic
- Water dispersible
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- Wide compatibility
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THE FLAME AND THE FLASK
Symbol of Quality

Ask for information about other Fatty Acid Esters available for specific applications.

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Another "Quality Controlled" application of Teflon by Doré

TEFLON* LINED ELLS
By DORÉ

PAT. PENDING

Liner molded to shape...not deformed

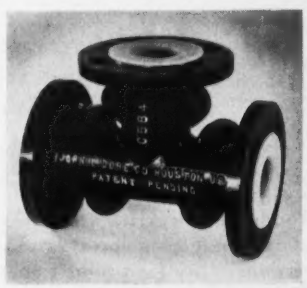
The pure, white Teflon liner, 1/8" thick, is precision molded in one piece. It is smooth, tough, dense . . . free of holes and has no welds. The flange seals are molded integrally with the liner. Covering the entire raised face of the flange, the seals are smooth and flat . . . not wavy. They seal without the use of an extra flange gasket.

Ells are ductile iron with flanges drilled for 150 psi. They are available in sizes 1" through 6". RATINGS: Pressure - 400 psi.; Vacuum - full; Temperature -90°F to 500°F.

Specify pipe and fittings lined with Teflon by Doré for corrosion-free, contamination-proof piping for a wide range of commodities. Write for Bulletin K-57-A for complete information and specifications.

*Du Pont's registered trademark for fluorocarbon resins, including tetrafluoroethylene resins.

Schedule 40 carbon steel pipe is lined with extruded Teflon, 1/8" thick. Available in sizes 1" through 6", lengths to 10 ft.



Tees lined with 1/8" Teflon are ductile iron, have standard face to C/L dimensions. Liner, including flange face seals, are one-piece molded Teflon. Tough, dense, smooth, free of holes and without welds.

John L. Doré Co.
5406 SCHULER • P. O. BOX 7772 • HOUSTON 7, TEXAS
EXPORT: 1505 RACE ST. • PHILADELPHIA 2, PA., U. S. A.
CABLE ADDRESS: DORÉA

SALES ENGINEERS FOR JOHN L. DORE, INC.
DU PONT'S TEFLON
HI-QUALITY NYLON

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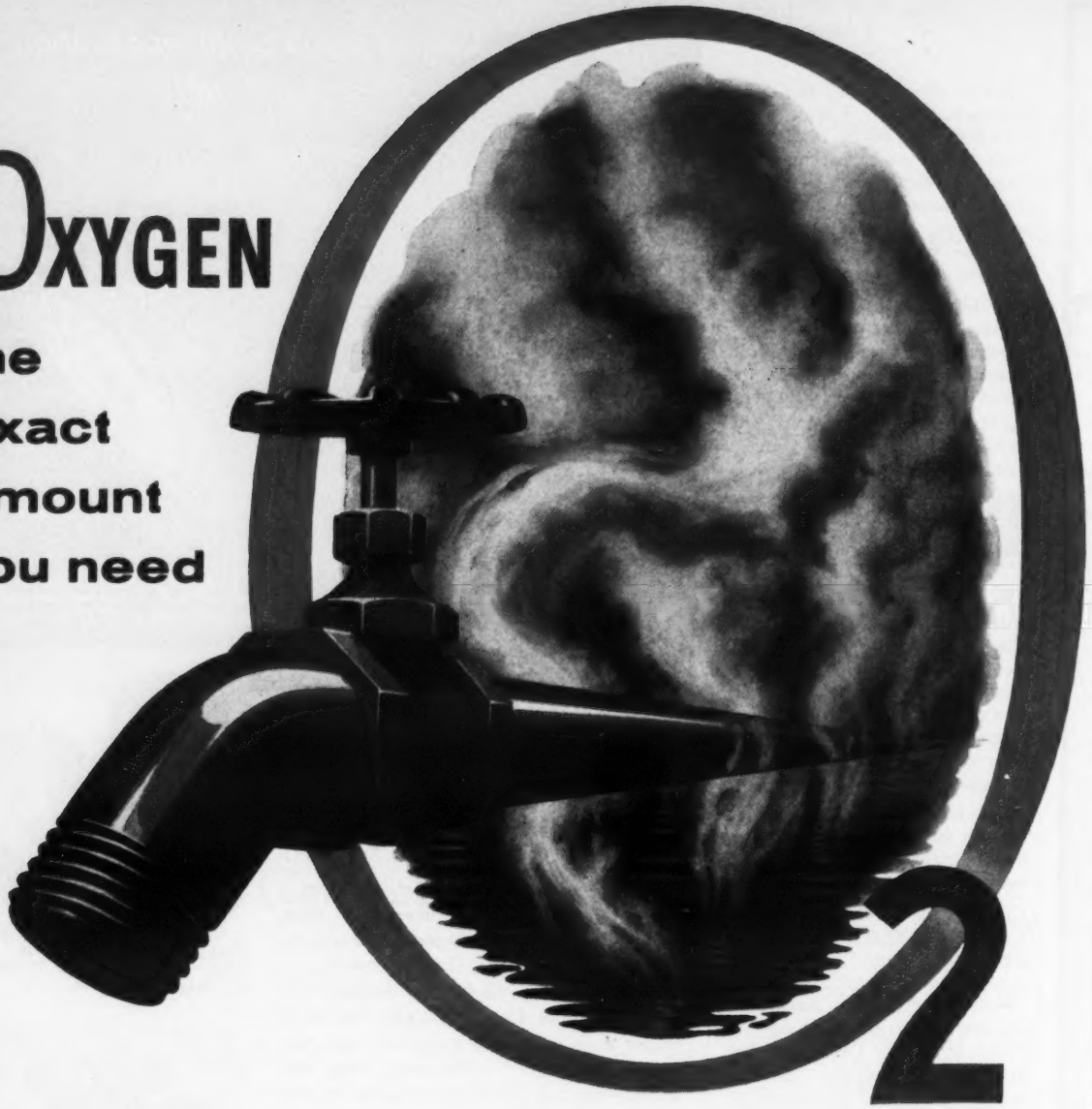
OXYGEN

the exact amount you need



You get it instantly—from LINDE

You have no worries whatever about an ample, dependable supply of oxygen for your process when you buy oxygen from LINDE. Full responsibility for production, transportation, and storage at your plant is assumed by LINDE.

Tonnage oxygen. Large amounts of liquid or gaseous oxygen can be supplied from a full-scale oxygen production unit—built and maintained by LINDE—directly to your plant. You pay only for the oxygen you use, at a price guaranteed by LINDE, with no capital investment on your part.

For varying needs. A DRIOX oxygen storage unit provides a continuous flow of liquid oxygen, or converts it automatically to gas. Constant pressure is maintained, even while the unit is being replenished. Or you can get LINDE oxygen in a single flask, a cylinder, or banks of cylinders.

Take advantage of LINDE's 50 years of development and service in the industrial gas field! Write, phone, or wire Dept. C-11. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

When you need Oxygen—call LINDE!

Linde TRADE-MARK

UNION CARBIDE

The terms "Linde," "Driox," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Check 2135 opposite last page

PEOPLE

(Continued from preceding page)

The new Process Chemicals Department in the Industrial Chemicals Division of American Cyanamid has H. C. MILTON as manager and R. M. GODDARD as sales manager.

JOHN T. TOOHY named chief operating executive, Squibb Division, Olin Mathieson Chemical Corporation. He succeeds JOHN C. LEPPART, who has retired from the corporation but will continue as consultant.

Named to staff the new marketing organization of the Dyestuff & Chemical Division, General Aniline & Film Corporation are J. R. BONNAR, sales manager of General Dyestuff Company; J. M. CLONEY, sales manager, Antara Chemical; C. M. KNOWLES, technical manager; and C. E. STEVENS, manager, sales development.

J. W. GILROY assigned post of export sales manager for Jefferson Chemical Company, Inc.

Union Bag-Camp Paper Corp.'s new chemical products division has A. B. DORAN as general manager, ELLIS O. BARNES as manager of manufacturing and research.

G. J. WILLIAMS succeeds DONALD L. GIBB as sales manager of The Dow Chemical Company's Plastics Department. Gibb becomes special consultant to company's sales department.

In anticipation of transfer of the Lexan® polycarbonate resin project from development to commercial stage, DR. A. EUGENE SCHUBERT is appointed general manager, Chemical Materials Department, Chemical and Metallurgical Division of General Electric Company. He succeeds SAM L. BROUS, who becomes marketing manager. JAMES A. RAYNOLDS, previous marketing manager, becomes consultant to general manager of division.

Inaccurate measure — 'thumb' stuff

If we measure something by rule of thumb today, it will probably mean an inaccurate measure. In the Middle Ages, however, the thumb was in general use for most small measurements. Since the average masculine thumb is just about an inch in breadth, tailors and carpenters in the Middle Ages used their thumbs to measure anything they happened to be working on. Thus, the rule of thumb became a byword for haphazard guesses. (**Gould Battery News**, Gould-National Batteries, Inc.)

Mildew stopper

Parmachem, a metallic organic compound which inhibits growth of common bacteria and mildew, will be incorporated in yarns for lingerie, carpeting, and other apparel and home furnishings applications by Celanese. Chemical will be incorporated in acetate, triacetate, and rayon yarns.

Mining microbes

Bacteria have been used to recover cobalt, nickel, copper, and manganese from low-grade ores. By oxidizing sulfur in the ores, the bacteria form sulfuric acid releasing free metal. (*Chemical News*, Manufacturing Chemists' Assoc.)

What's 'oil' this?

Petroleum products from stagnant ponds? — Could be. In experiments at the University of California, researchers are working with algae as a potential energy source. They figure that a ton of the green, single-cell plants that thrive in stagnant water could be converted to about 45 gal of gasoline — if it were economically feasible.

This Ell Bolt is the Key to leak control

The patented Ell Bolt construction employed on Vogt floating head heat exchangers is the answer to reassembly without distortion or leak development.

Cover may be removed by simply loosening the Ell Bolt nuts and disengaging the Ell Bolt heads from the "lock notches." No misplacing of Ell Bolts can result — and tightening is easy and positive — absolutely leak proof. Send for Bulletin HE-6. Address Dept. 24A-XCP.

Vogt

HENRY VOGT MACHINE CO., P. O. BOX 1918, LOUISVILLE 1, KY.

SALES OFFICES: New York, Chicago, Cleveland, Dallas, Philadelphia, St. Louis, Charleston, W. Va., Cincinnati,

OTHER VOGT PRODUCTS
Drop Forged Steel Valves, Fittings and Flanges in a complete range of sizes • Petroleum Refinery and Chemical Plant Equipment • Steam Generators • Heat Exchangers • Ice Making and Refrigerating Equipment.

HEAT TRANSFER EQUIPMENT

Check 2136 opposite last page

Check 2137 opposite last page

CHEMICAL BUSINESS / Our Growing Industry

Pennsalt Chemicals Corporation's new methylamines plant in Wyandotte, Mich., is now on stream. Constructed by Catalytic Construction Company, facilities produce mono-, di-, and trimethylamine, make Pennsalt a manufacturer of complete line of lower alkyl amines from methyl through amyl. Sizable growing captive use was a primary factor behind new plant.

Union Carbide Chemicals Company, division of Union Carbide Corporation, has doubled production capacity for acrylonitrile at Institute, W. Va. Company also is going ahead with building of new unit at same location for producing over 10 million pounds a year of epoxides and other oxygenated chemicals. This will be completed by mid-1959.

Latter unit will make Epoxide 201, vinylcyclohexene dioxide, vinylcyclohexene monoxide, dicyclopentadiene dioxide, styrene oxide, allyl epoxystearate, and caprolactone. Same facilities will be used for commercial custom epoxidation of materials which are either difficult or impossible to epoxidize with the usual chemical reagents.

Eastman Chemical Products, Inc., has entered the polypropylene picture. Company's new process has been placed in pilot-plant operation by Texas Eastman Company at Longview, Texas. It was invented at the research laboratories of Tennessee Eastman, is based on new catalysts covered by U. S. and foreign patent applications. Eastman Chemical is marketing arm for the last two companies, both divisions of Eastman Kodak Company.

General Mills is about ready to start production of epoxidized soybean oil in new Minneapolis, Minn., facilities. Company process will be used. Epoxidized soybean oil is used extensively as plasticizing stabilizer for polyvinyl chloride resins.

Air Reduction Company, Inc., announces oxygen and nitrogen activities: new oxygen and nitrogen plant set for first-of-year operation at Denver, Colo.; and a second plant, in Kansas City, Kansas, set for startup this December. Latter will have monthly oxygen capacity of 5 million cu ft, will also produce high-purity nitrogen.

Company recently expanded gaseous and liquid oxygen production at Lorain, Ohio, boosting daily production capacity from 40 to about 100 tons a day.

Shell Chemical Corporation will begin building a phenol unit at its Houston plant early in 1959. Most of the product will be used to manufacture Bisphenol A, one of two principal ingredients in company's Epon resins. Shell Oil Company will also take a share of the phenol. Unit, scheduled for completion in late '59, will produce acetone as co-product.

American Potash & Chemical Corporation's new sodium chlorate plant at Aberdeen, Miss., is scheduled to begin production late this year. It will supply the rapidly growing southern pulp and paper industry. Initial capacity will be 15,000 tons a year, but provisions will be made for possible future expansion that might be needed to take care of product application in high-energy missile fuels, for example.

Engineering has been under the direction of the construction engineers, C. F. Braun and Company.

Merck & Co., Inc., has completed a $1.5-million chemical process plant at Danville, Pa. It's part of company's new $5-million facilities for expanded production of ultrapure silicon for the electronics industries. Wigton-Abbott built the plant, installed all process equipment.

For more information on developments reported in this magazine, check corresponding numbers on Reader Service Slip opposite last page of this issue.

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CHLOROSULFONIC ACID

IRON

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ZINC

MONOHYDRATED ZINC SULFATE
ZINC OXIDE

MANGANESE

MANGANESE SULFATE
MANGANOUS OXIDE
MONOHYDRATED MANGANESE SULFATE

Samples, specifications and detailed information upon request.

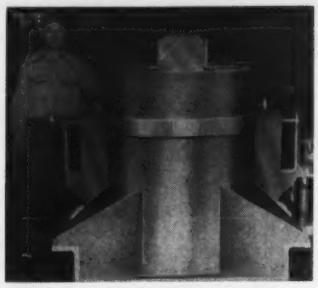
TC
TENNESSEE CORPORATION

TENNESSEE CORPORATION
617-629 Grant Building, Atlanta, Ga.

Check 2138 opposite last page

nuclear notes

Significant news about atomic energy



Ship spent fuel elements in 10-ton containers

Stainless steel casks buttressed by an 11" shield of lead are being used to ship spent fuel elements from atomic reactors. Weighing about 10 tons, units are fabricated of two layers of stainless steel with an intermediate layer of lead. Lead shield weighs about 8½ tons. Units were cast by Federated Metals Division of American Smelting and Refining Company. They were developed by Ameray Corporation of Kenvil, N. J.

Fission products pilot plant

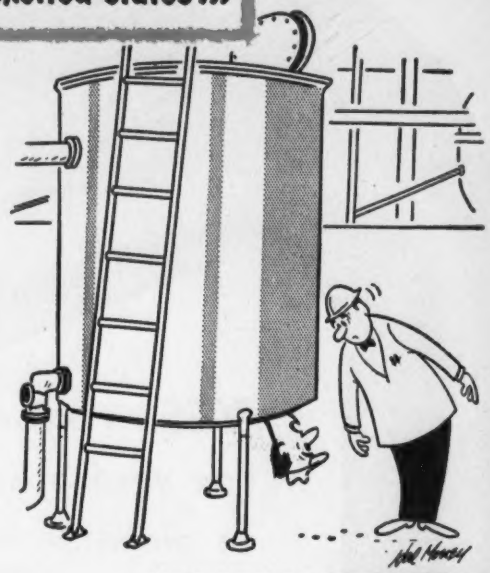
AEC has started up a fission products pilot plant at Oak Ridge. Costing about $2.2 million, plant is equipped for separation, purification, and fabrication of kilocurie quantities of such long-lived radioactive fission products as cesium-137, promethium 147, cerium 144, strontium-90, and technetium-99.

Safety device perfected for nuclear reactors

Reactor safety "fuse", which automatically shuts down high power nuclear research reactors if operating control is lost, has been successfully tested. Fuse is completely self-contained and requires no operator or external connections.

It includes a cylinder, part of which is in the reactor core. Portion of cylinder outside

Life in these excited states...



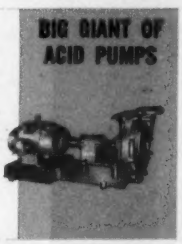
"I think I've found the leak, chief!"

A safer way to stick your neck out

Good equipment costs so *little* more, it pays to stick your neck out and ask for it. If the boss is cost conscious you'll *get* it. He too knows the dollars lost by corrosion and contamination. You're always safe when you specify Ace piping, valves, pumps and tanks.

Ace chemical-resistant rubber-lined steel pipe best for high-pressure, big sizes, or abrasives. Pipe, fittings and valves 1½ to 24".

Highly efficient *WE* pump. Capacity to 360 gpm. Cast iron, fully protected by top quality, chemical resistant hard rubber lining.



Design assistance and facilities for molding special fittings, pump parts, etc., of plastics or hard rubber. Also large hand-fabricating facilities.

Variety and quality to match *any* plastic piping. Riviclor PVC, Ace-Ite rubber-plastic, Parian poly, Ace Saran, Tempron high temperature nitrile, hard rubber-lined steel.

ACE processing equipment of rubber and plastics

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DIVISION OF AMERACE CORPORATION
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ACE

See our pages in eee Catalog!

Check 2139 opposite last page

BIG-DIAMETER PLASTIC PIPE?

YES...PLASTIC PIPE FOR YOUR PLANT UP TO 8" IN DIAMETER IS NOW AVAILABLE MADE FROM A-C POLYETHYLENE PIPE COMPOUND.

Now your plant can realize the advantages of plastic piping in large-diameter sizes as well as small. Plastic pipe—light, flexible, long lasting—can now be made up to 8" or more in diameter . . . with A-C Polyethylene Pipe Compound, the ultra-high-molecular-weight polyethylene.

More than 200,000 feet of this new pipe are already in use in chemical plants. Reports indicate substantial savings in installation, compared with metal pipe. Projected maintenance costs are phenomenally low. Unlike pipe made from conventional polyethylene, this new piping is completely free of stress cracking, splitting or pinholing. It has exceptional resistance to temperature variation, abrasion and corrosive chemicals.

The great strength of polyethylene pipe makes it ideal for maintenance applications. The smooth bore reduces flow resistance and prevents accumulation of deposits. How strong is it? In a typical test involving sudden surges of pressure, this pipe has withstood surges from 100-300 pounds per square inch for more than 90,000 cycles without failing.

ADVANTAGES of piping made with A-C Polyethylene Pipe Compound

Extraordinary chemical resistance. Withstands acids, alkalies, salts and detergents. Pure and inert for use with potable water.

Long service life. Will not rot, rust or corrode. Impervious to electrolytic environment. Good weather resistance.

Easy installation. Much lighter in weight than metal (about ⅛ the weight of steel). Long lengths readily joined by flanging or welding.

No stress cracking. The only plastic pipe completely free from environmental stress cracking. Impact resistance of pipe is 13 ft-lb/in notch.

Surge resistance: (2-inch schedule 40). Withstands pressures from 100-300 psi for over 90,000 cycles.

Good heat resistance. Greater resistance to temperature variation, hot or cold, than any comparable material.

Low cost. Below that of any metal pipe.

Sample lengths available to those who

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Semet-Solvay Petrochemical Division, Dept. 118-P
40 Rector Street, New York 6, N.Y.

Please send me more information, including names of pipe manufacturers using A-C Polyethylene Pipe Compound.

Name_____

Position_____

Firm_____

Street_____

City_____ Zone_____ State_____

Check 2140 opposite last page

core contains boron trifluoride gas. In event of reactor transient, or excessively high level of operation, gas is automatically released into lower part of cylinder.

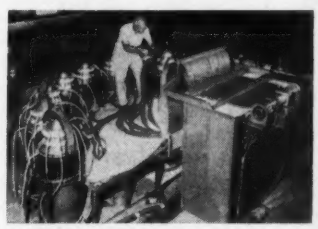
Gas acts as reactor "poison" by absorbing neutrons needed to maintain chain reaction. Gas transfer brings reactor under almost instant control without damage to reactor.

Fuse was designed and built for AEC by Atomics International, a division of North American Aviation, Inc., Canoga Park, California.

Scylla helps in fight to control fusion

One of the newer tools being used at Los Alamos in attempts to control thermonuclear reactions is a machine called Scylla. Device uses a deuterium plasma which is heated by compression.

To achieve high temperatures, compression of the plasma must occur very rapidly without an appreciable influx of impurities from walls of the containing vessel. These requirements have led to use of a rapidly rising, oscillating magnetic field for exerting necessary pressure on the conductive plasma.



Latest Los Alamos tool used for fusion studies was exhibited at Geneva atomic energy conference in September

During first half cycle, deuterium gas becomes a plasma by electrical breakdown induced by the changing magnetic field. In next and later half cycles, the hot plasma is periodically compressed to still higher temperatures. Bursts of neutrons, as many as 10 million per pulse, are observed during time of second and later peak compressions.

THAT'S INTERESTING

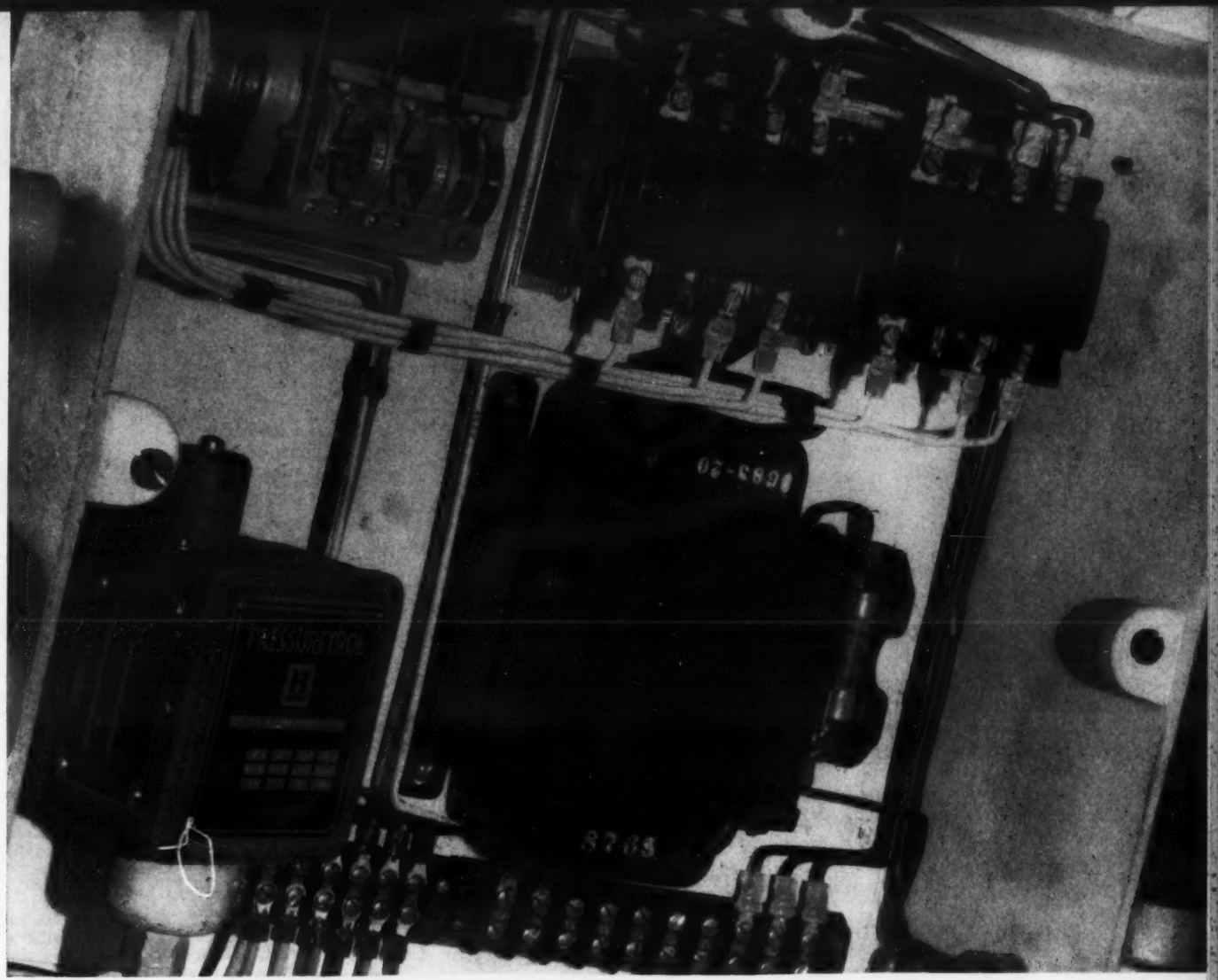
Converts heat to electricity

An "essentially unexplored" class of materials which can convert heat of burning fuel, or other high-temperature source of heat, directly into electricity has been discovered by scientists at Westinghouse Research Labs in Pittsburgh. Called thermo-electric materials, substances produce electricity simply, without any moving parts.

No, they don't wind 'em up

Yes, those little foreign cars do use gas, or petrol if your prefer, and, believe it or not, they sometimes do run out. However, manufacturer is putting a crimp in romantic Rhinelander's style by developing spare tank. Holding two gal, it fits unobtrusively into area encircled by rim of spare tire. (*German American Trade News*, German American Trade Promotion Office)

For more information on product at right, specify 2141 see information request blank opposite last page.



For "set it and forget it" gas drying—

Come to Kemp

Kemp Dryer protects instrument lines at −25° for Quaker State's Farmer's Valley, Pa. plant. Fully automatic operation saves time and manpower, yet provides dependable service on a 24 hour basis.

Here's the nerve center of every Kemp Fully Automatic Gas Drying Unit. Drying process gasses and inerts . . . air for pneumatic instruments and tools . . . liquids . . . for pressurizing anhydrous liquids . . . this panel controls the Kemp Dryer surely and safely. Once timed to meet your program, it provides efficient drying on a continuous basis, without worry or excessive maintenance.

Note the precision with which even the wiring is connected. It's typical of the thorough workmanship going into every component of the Kemp Dryer. Kemp Dryers are built with care; built to last and perform year after year with dependability resulting from a quarter century's experience.

Whether your operation calls for a completely automatic Kemp Dryer, a semi-automatic model, or a simple, manually operated unit, there's a model and capacity to meet your needs. Kemp Field Engineers will gladly study your problem and make complete recommendations, even down to the proper desiccant (we select from over 20) to do your job best.

Call in your Kemp Representative when you plan a new installation or wish to up-date an old one. He'll give you full information. Or write direct and ask for Bulletin D-102: THE C. M. KEMP MFG. CO., 405 E. Oliver Street, Baltimore 2, Maryland.

Convection Dryers

Inert Gas Generators

KEMP

Nitrogen Generators

Oriad Dryers

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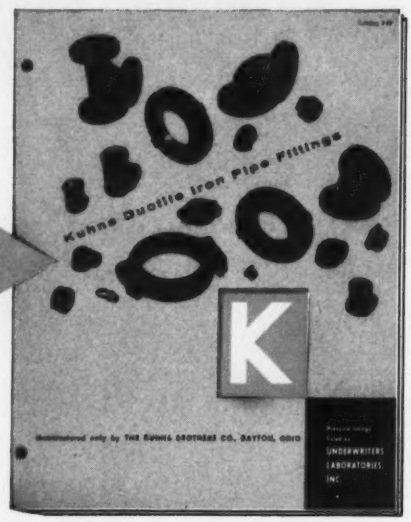

Get complete data on—

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- Typical applications
- Safety factors and service ratings by Underwriters' Laboratories, Inc.
- Prices
- Physical properties; production control tests
- Specifications—A.M.S., A.S.T.M., Ordnance, Navy, Coast Guard, National Fire Protection Association, National Board of Fire Underwriters, Corps of Engineers
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Send me a free copy of Catalog 2-PF on ductile fittings.

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COMPANY_____

ADDRESS_____

Check 2142 opposite last page

NUCLEAR NOTES

Sampler collects, measures radioactive dusts

High-volume airborne particulate sampler, which collects and measures radioactive or non-radioactive dusts, fumes, and other pollutants from atomic or chemical plants has been developed. Built around a turbine-type blower, unit inhales up to 75 cfm. Device can be used for random or round-the-clock sampling, indoors or outdoors, and comes with choice of filters designed for alpha, beta, or gamma counting.

(Further information about air sampler can be obtained from Nucleonic Corporation of America, 196 Degraw St., Brooklyn 31, N.Y.)

Check 2143 opposite last page.

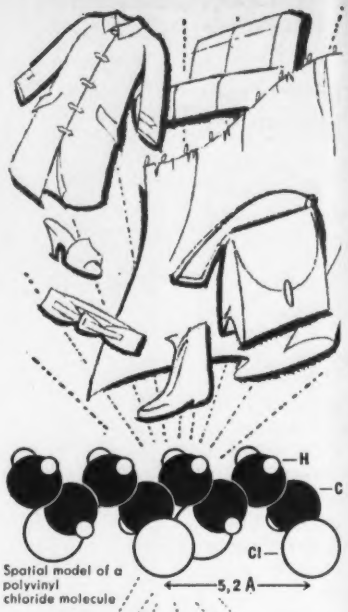
Waste calcination system for reactor test station

AEC has awarded The Fluor Corporation, Ltd., a $300,000 contract modification to do detailed engineering work for waste calcination system to be built at National Reactor Testing Station, near Arco, Idaho. Calcination process was jointly developed by AEC, Fluor, and Phillips Petroleum Company.

When system goes into operation, radioactive liquids will be processed into a dry material and stored in underground stainless steel vaults. In addition to reducing storage space needed, system is expected to increase safety in the storage of nuclear wastes, and eventually to lower waste disposal costs.

Role of radiation grows in chemical processing

Nuclear reactors can now be used to process petroleum and chemicals in commercial quantities, but more research must be done to decide which processes can use radiation competitively with conventional methods, according to report presented at Geneva conference by team of Esso



Spatial model of a polyvinyl chloride molecule

plastics perfumery

In the expanding plastics world of today, vinyls are often found in end products that have close personal contact with the consumer. Belts, purses, shower curtains, raincoats, seat covers and shoes represent an increasingly large outlet for vinyls... and in such "close-up" items malodor, caused by certain stabilizers and plasticizers, can become a definite sales deterrent. The D&O Industrial Odorant Labs have had wide experience in the development of both masking agents and fragrance additives for the highly specialized field of plastics perfuming. No line is offered... for each formulation and each process is different, and requires individual attention. Whether your vinyl product requires the masking of malodor or the addition of a pleasant, sales stimulating fragrance ...the D&O Labs are equipped to provide it for you, tailor made! Consult D&O.

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Essential Oils • Aromatic Chemicals • Seasonings
Perfume Bases • Flavor Bases • Dry Soluble

Check 2144 opposite last page

Research and Engineering Company engineers. In the paper, the U. S. team indicated that radiation may be able to reduce degree of pressure and temperature now needed, to augment or replace catalysts, and improve quality of products.

Fire protection practice for nuclear reactors

Recommended fire protection practice for nuclear reactors has been published by the National Fire Protection Association. Booklet's 64 pages cover fire and explosion considerations in nuclear reactors, at same time including information on design features and operational problems of reactors themselves. Material was prepared by the NFPA committee on atomic energy, on which representatives of AEC, industry, insurance, and other consultants serve.

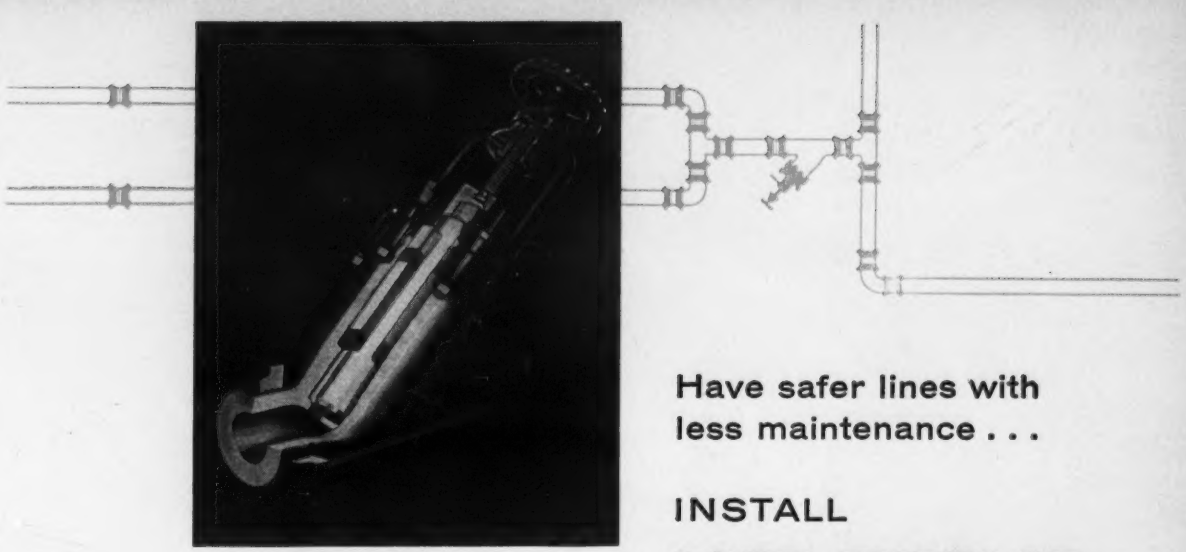
(Copies of "Tentative Recommended Fire Protective Practice for Nuclear Reactors," NFPA No. 802-T, may be obtained by remitting $1.00 direct to National Fire Protection Association, 60 Batterymarch Street, Boston 10, Massachusetts.)

EBWR turbine failure cause determined

Investigation of failure of turbine generator of EBWR at Argonne National Laboratory, has disclosed that failure was caused by excessive stress resulting from notch in a blade root.

Turbine rotor was removed during shutdown and examination disclosed that one of the blades and its shroud became detached from rotor. Row of new blades was installed and turbine delivered full power again shortly afterwards.

Examination of manufacturing procedures indicated that one of the clamps used to hold blades during machining had been incorrectly adjusted, causing notch.



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SOLID CHEMICAL PORCELAIN ARMORED WITH FIBERGLASS-REINFORCED PLASTIC

The extra margin of safety essential to many process plants where protection of personnel, equipment and product is vital is assured by the bonding of TUFCLAD fiberglass-reinforced plastic to Lapp Chemical Porcelain. Strong fiberglass fabric is impregnated and bonded in multiple layers to the porcelain with an Epoxy resin of high strength and chemical resistance. It cushions accidental blows—acts as an insulator against thermal shock—and because TUFCLAD is so strong and tough, it will hold operating pressures even when porcelain is damaged by accident. Specify Lapp TUFCLAD Chemical Porcelain and enjoy the purity and corrosion resistance of a solid porcelain system with extra security from TUFCLAD armor.

Y-Valves, as shown, and Angle Valves are available in Lapp TUFCLAD Chemical Porcelain in ½", 1", 1½", 2", 3", 4" and 6" sizes. Also safety valves, flush valves, plug cocks, pipe and fittings (to 8" diameter) and special shapes.

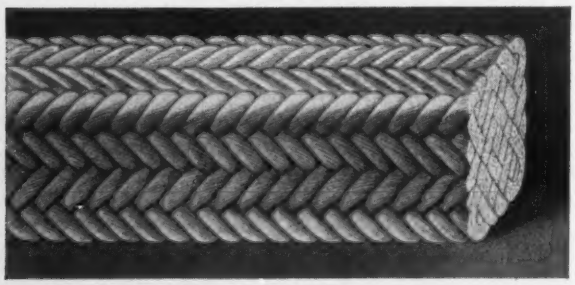
WRITE for description and specifications. Lapp Insulator Co., Inc., Process Equipment Division 2102 Chestnut St., Le Roy, N. Y.

Check 2145 opposite last page

One of the Reciprocating Pumps used in solvent recovery at Kodak. Cutaway area shows how LATTICE-BRAID Packing is applied to pump piston.

Garlock LATTICE-BRAID* Teflon† Packings Help Kodak Recover 95% of Film Solvent for Re-Use

Applied on more than 100 pump pistons at 100 psi pressure, Garlock LATTICE-BRAID Teflon packings prevent leakage of solvents being refined for use again at Kodak. They create practically no wear on cylinder liners while the piston moves at rates up to sixty 12″ strokes per minute. Longer operating life is assured: first, because of the lattice-braid construction, a completely through-and-through braiding of greater strength; second, because of the physical properties of chemically-inert Teflon yarn—low friction coefficient, temperature stability, excellent cold-flow resistance.



LATTICE-BRAID cross section shows how Teflon yarn passes diagonally through packing body at 45° angle for greater strength.

Installed at Kodak 2½ years ago these Garlock LATTICE-BRAID Teflon Packings have increased pump efficiency and provided reliable service, without shutdown for maintenance.

LATTICE-BRAID Teflon Packings are another important part of "the Garlock 2,000" . . . two thousand different styles of packings, gaskets, and seals to meet all your needs. The only complete line. That's why your Garlock representative can give you unbiased recommendations. Call him or write for LATTICE-BRAID Folder AD-131.

*Registered Trade Mark.
†DuPont Trade Mark.

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Molded and Extruded Rubber, Plastic Products

THE GARLOCK PACKING COMPANY, Palmyra, N. Y.
For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U. S. and Canada.

LOST YOUR SLIDE RULE?

Then CP's Processing and Engineering Data Section is for you!

Each month, this section contains time-saving nomographs, tables, or charts which other data savers have found extremely useful in speeding calculations. Perhaps, you will find them to be of value to you.

A wide variety of information can be found in this section.. So no matter what your particular field you will find suitable data to aid you in your daily work.

And —

the section pages are designed to fit easily into regular data files.

Keep them handy for use in making quick, calculations in the plant or office.

Just cut along the marked edge, punch as indicated, and insert them into your notebook.

So —

be sure not to miss this month's "Data Section." It begins on page 61.

For more information on product at left, specify 2146 see information request blank opposite last page.

Sodium-cooled reactor cost study

Completion of a preliminary design of a 205,000-kw sodium-cooled reactor power plant shows that it would be increasingly economical in larger sizes, according to a GE report presented at recent Geneva atom conference. The paper stated that sodium-cooled installations could compete favorably with boiling-water reactor powered stations in plant sizes of 600,000 kw.

Atom conference proceedings to consist of 34 volumes

Orders are being accepted by United Nations in New York City for complete proceedings of the Second International Conference on the Peaceful Uses of Atomic Energy held in Geneva, Switzerland, recently. Consisting of 34 volumes, prepublication price for English edition has been established at $435.00. Orders must be in by November 30, 1958.

Atom plant components not too hot to handle

Normal maintenance methods can be used on the turbine-generator in the GE-Pacific & Electric Vallecitos nuclear power plant despite production of steam directly inside reactor core, GE personnel reported at Geneva atom conference. Tests revealed that radioactivity within turbine casing falls to fraction of a milliroentgen an hour after shutdown, permitting direct handling of parts.

Radioisotope course for industry

AEC has announced plans for new series of radioisotope techniques course at Oak Ridge, especially designed for members of industry. First course begins February 9, 1959.

for exacting production schedules . . .

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POLYETHYLENE
GLYCOLS

Poly-G 200, 300, 400 and 600 are clear, odorless, viscous liquids which are soluble in water, acetone, ethanol, ethyl acetate and toluene. Poly-G 1000, 1500 and B1530 are white waxy materials having slightly less water solubility than the lower members of the series. The Poly-G's are produced to meet the most exacting requirements . . . delivered directly by our own fast-moving fleet of tank cars and tank trucks . . . stocked locally, in resin-lined drums, by Mathieson distributors in key industrial areas.

Technical assistance is also available, to help with your specific problems. Contact your local representative for complete information or write today.

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Ethylene Diamine
Diethylene Glycol
Triethylene Glycol
Polyethylene Glycols (Poly-G's)
Polyamines
Ethanolamines
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Surfactants (Poly-Tergents)
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ORGANIC CHEMICALS

OLIN MATHIESON CHEMICAL CORPORATION
745 FIFTH AVENUE, NEW YORK 22, NEW YORK

5633

Check 2147 opposite last page

268 ACRES OF PLANT

This huge petrochemical installation was engineered and constructed by Chemico—working with the client's own technical staff. The facilities cover approximately 268 acres. Designed to utilize the client's own processes, this mammoth, integrated plant was completed by Chemico with a minimum of difficulties and delays. Details of the project were given the closest attention by an organization geared to handle the biggest and most complex chemical and petrochemical process installations.

In the field of general process engineering, few can match Chemico's remarkable record of achievements. Consult Chemico before you decide. Write today for a copy of the new Chemico general bulletin.

CHEMICO

CHEMICAL CONSTRUCTION CORPORATION
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For more information on product at left, specify 2148 see information request blank opposite last page.

FOR THE MANAGEMENT TEAM
NOVEMBER 1958

CHEMICAL PROCESSING

Highlight of Shell's management course is free questioning by participants during each session. Like other Shell executives, Shell Chemical's president R. C. McCurdy answers questions asked by thirty managers

Sales and organization of Shell Oil Company—especially Shell Chemical Company—have multiplied many times since World War II. This rapid expansion has meant an unprecedented demand for managerial talent. After running a "School for Managers" for over two years, Shell finds . . .

'IN COMPANY' executive training benefits both top management and managers

Since World War II Shell's business and organization have experienced extraordinary growth. Crude oil reserves have doubled. Refinery capacity and retail sales have almost doubled. Shell Chemical Corporation sales have multiplied eight times.

This rapid expansion has resulted in an unprecedented requirement for skilled managers at all levels, both for existing and for new facilities and activities. And Shell believes that as its growth continues an increasing number of knowledgeable and skillful managers will be required.

Vacancies have been filled almost without exception at Shell from the ranks of employees by a program of promotion from within. To foster and accelerate the process of individual self-development, Shell's program includes encouragement and coaching by supervisors and, where practical, the provision of broadening assignments and group training.

'In-Company' Management Course

Besides sending a few individuals to university management courses and providing supervisory courses at many locations, Shell has also initiated a form of group training called the Shell Management Course.

Aim of this four-week course, now well into its third year, is to help participants fit themselves for broader managerial responsibilities. The instructors are Shell's top executives and recognized outside authorities. The Course is designed to give the students insight into:

1. Shell's operations, functions, and integrated relationships
2. Economic, social, and political trends and issues which affect the chemical and petroleum industries
3. Functions and skills of modern managers

Given at Arden House campus of Columbia University about 50 miles north of New York City, the course is opened by M. E. Spaght, executive vice president of the parent company. He discusses the Shell companies, and Shell's concept of organization and management practices. During the days and weeks that follow, the executives of

To page 99

After-hours exchange of ideas among participants is one of the dividends of management course.

Optimistic chemical industry management is looking forward to continued growth in U. S. economy . . . hence, increased demand for its products . . . and thus tells why

WE'RE BUILDING NOW

In a survey of some of the major chemical producing companies we asked for statements about present expansion plans. Here are specific views of management, expressed in terms of their building plans.

'We're not pulling in our horns'

John A. Hill, President, Air Reduction Company, Inc. — Expansion and modernization must continue even in periods of business recession.

In this period of recession, we are not pulling in our horns as far as our modernization and expansion program is concerned. If we were to try to guess the short-range swings of business and so defer essential parts of our expansion program, we would very likely find ourselves short of product when business becomes good again. This is entirely contrary to the policy which has governed Air Reduction for the past ten years.

We admit that this policy leaves the company with excess capacity in periods of recession. But if we did not have excess capacity in a time of recession, we would certainly be very short of capacity in the better times to come.

John A. Hill

'Capital expenditures $75 million or more in '58'

L. C. Perkinson, Vice President, American Cyanamid Company — Confident of the eventual uptrend in general business and the longer-term outlook, Cyanamid is proceeding approximately on schedule with its programs for new plants and expanded facilities, which will involve estimated capital expenditures of $75 million or more during 1958.

Basic considerations include: 1) decision to introduce new products requiring new production facilities, 2) development of new and more efficient production processes for existing products for which new equipment is required, 3) anticipated increase in demand for existing products.

The more significant capital projects currently under way consist of the following:

1) At Fortier, near New Orleans, construction is nearing completion on facilities which will double production of acrylonitrile, to an estimated 100 million lb/year.

2) Near Pensacola, Florida, the new Santa Rosa plant of the Fibers Division is going up, to produce a new acrylic fiber, Creslan®, with a capacity of 27 million pounds.

3) At Savannah, Georgia, the titanium dioxide plant is being doubled in production capacity, to 72,000 tons annually.

4) The first urea plant in Canada is going up at Hamilton Bay, Ontario, to produce 66,000 tons of urea annually.

5) A new plant is being constructed at Farmville, North Carolina, for manufacture of flakeboard, with an annual capacity of 40 million square feet of board. Flakeboard will be used as an underlayment for Formica® laminated plastics and other uses.

Other projects include expansion of facilities for producing melamine and urea compounds at Wallingford, Connecticut, new facilities for maleic anhydride at Bridgeville, Pennsylvania, and a plant for producing anthraquinone by a new process at Bound Brook, New Jersey.

'Build wisely but build now'

Harry Krehbiel, President, Catalin Corporation of America — In a time of increasing competition and decreasing profits, we at Catalin Corporation of America feel that a building program can be a very sound investment when related to an effort to improve economic footing.

In the first place, a firm must continually strive for the development of new products if it is to show continued prosperity. This, of course, generally entails an expansion of physical facilities, especially in the case of radically new products.

Second, we feel that a firm cannot **afford** to continue manufacture of existing products without attempting to improve the methods of production and thereby cutting down overhead. In the long term, savings resulting from production changes will more than outweigh the cost of construction which is necessary to bring them about.

Once a building program has been decided upon, it would seem unwise to put it

Harry Krehbiel

off until such time as there is a decrease in construction costs. Judging from the economic weathervane, this country is still in a period of healthy growth, and costs will continue to go up instead of down. That is why we say at this time, "Build wisely but build now."

'Building now . . . is sound'

W. Ward Jackson, Vice President — Sales, Commercial Solvents Corporation — CSC plans to go ahead with further plant construction, based primarily on new processes and new or growing markets for chemicals. Regardless of the depressed position of portions of the industry, we are most optimistic about the long-range chemical picture.

Market surveys and application work done on new products particularly would indicate that building now or in the immediate future is sound. Our recent expansion of the methylamines and our current construction of a caprolactam plant are examples

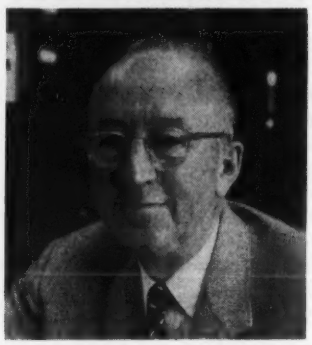
W. Ward Jackson

of our approach both to markets that are growing and to those that are new.

In chemical derivatives, particularly, we are aware of a constant need for reappraisal of markets, improvement in processes, and the development and evaluation of new end uses to keep up with and ahead of competition. Plant construction now or in the immediate future will be based on our desire to improve current profits or to develop new areas of profits, to lower costs, and to strengthen our position in the chemical industry.

'Will spend close to $100 million each in '59 and '60'

Dr. Leland I. Doan, President, The Dow Chemical Company — In our fiscal year ended May 31, 1958, we put about $185 million into expansion of facilities at our various divisions — the largest amount in our history. That brought our spending for new plant and equipment to a total of nearly $1 billion in the past decade.



Dr. Leland I. Doan

Historically, expansion outlays have run on a five- to six-year cycle. We peaked in 1947 at $84 million and again in 1952 at $145 million.

In fiscal 1959, our present estimate is we will spend in the neighborhood of $75 million for added facilities, representing the normal dropping back from a peak. Future economic events could change these plans, of course.

As for the long pull, we are decidedly optimistic, and our projected expansion program is geared to estimates of expanding demand for all our major product lines, industrial

Last month (page 28), plant construction firms brought out reasons for building now . . . for economy, quality, and speed. Here is what top management men in leading chemical companies have to say on the subject.

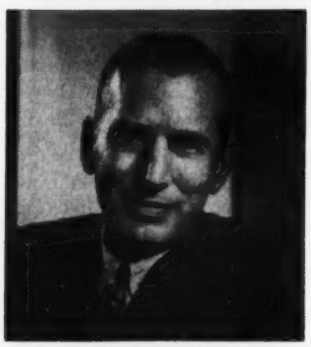
WE'RE BUILDING NOW —*From preceding page*

chemicals, plastics, magnesium, and agricultural chemicals over the next several years.

'1958 expansion to be 10% more than '57'

Crawford H. Greenewalt, President, E. I. du Pont de Nemours & Company — We are of course making every effort to reduce costs wherever possible, but in those categories affecting the long-term position of our business we are maintaining and where appropriate increasing rates of expenditure.

For example, outlays for construction in the year 1957 were at the all-time high level



Crawford H. Greenewalt

of $220 million. We are making no curtailment in our construction program for 1958 and expect expenditures in the current calendar year to exceed by perhaps 10 percent the amounts expended in 1957.

Our working capital position is sound and our inventories are not out of line.

'Investment in the future'

L. G. Bliss, President, Foote Mineral Company — The "right" time to invest in new facilities depends upon several factors. If the product has been satisfactorily researched, the market judged sound and of encouraging potential, the proposed process competitive, and adequate financing available, then a progressive company has little choice but to proceed.

L. G. Bliss

Existence of a general business recession should not unduly influence decisions to invest in promising specifics. Such investments are usually made in times of lower building costs and cumulatively contribute to the desired change in business climate.

To support our contention, we are building a new transistor-grade silicon plant, researched and designed in good economic times. We have reasoned that if transistor-grade silicon offered a promising new market to producers in a fast-growing electronic industry in a healthy economic time, development should be of even greater importance in an economy that is slightly ill.

During the next 18 months, Foote Mineral Company expects to spend several million dollars on a completely new research and development center. Essentially, this is an investment in the future, because we believe the company's long-range welfare is inexorably wedded to creative research.

To make an investment of this nature, in the face of disturbing business uncertainties, is not rash. It is consistent with the belief that growth and progress in our country is inevitable. An investment in research is the sound method to contribute to, and participate in, that growth.

'Will take advantage of opportunities'

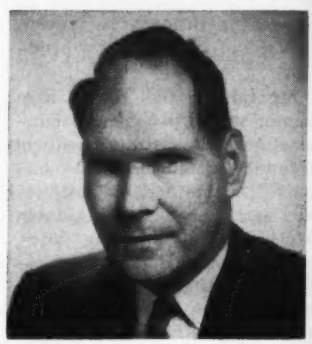
Irving C. Smith, Vice President, Monsanto Chemical Company — Monsanto's capital investment program for 1958 will be in the neighborhood of $50 million, a level of spending not greatly changed from the previous year. As for 1959, there is no reason to believe, in the light of present conditions, that there should be any great change in the rate of building or the nature of the construction involved.

In our major projects this year, most of them have embodied technological improvements as well as expansion. Research, development, and changing market patterns always make it necessary to be on the alert for occasions when building would be necessary and advisable. Such opportunities undoubtedly will continue to occur, and Monsanto will take advantage of those where studies show the investment to be sound — not just construction for construction's sake.

Irving C. Smith

'Lower building costs, faster delivery'

R. W. Merritt, Vice President — Manufacturing, National Starch Products Inc. — Our company is continuing its expansion program involving installation of equipment to produce new products resulting from our research program and to increase capacity for making older products for which demand is increasing. Other equipment going in will reduce operating costs.

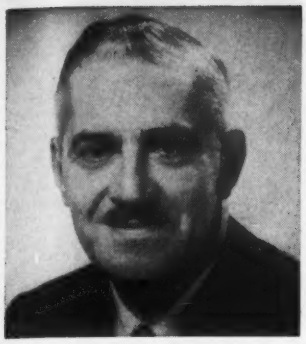


R. W. Merritt

We have found it possible to negotiate lower-cost contracts for buildings and equipment during 1958 than has been the case in the past few years. In addition, delivery times on materials are shorter, reducing the time lapse between investment and return.

'Plan to spend $20-25 million in '58'

Herman A. Poitras, Vice President — Production, Chas. Pfizer & Co., Inc. — In 1957, our company launched a broad capital expansion program expected to cost approximately $60 million. Of this total, Pfizer spent about $14.5 million last year and plans to spend about $20 to $25 million in 1958, divided equally between domestic and foreign projects.



Herman A. Poitras

The growth-minded decision to forge ahead with new plant construction despite a downturn in some segments of the economy was dictated by a continuing management philosophy of product diversification, extensive scientific research, and energetic marketing.

Pfizer's confidence in the future, which takes expression in the form of new building, is buoyed by the knowledge that the company's products are largely indispensable for health throughout the world. More than 90 percent of Pfizer's daily production is consumed by humans and animals, necessitating constant replenishment.

In addition to construction of a new biochemical and chemical research laboratory at Groton, Connecticut, Pfizer has completed new facilities for the production of vaccines and biologicals at Terre Haute, Indiana.

Also scheduled for completion and inauguration in 1958 are pharmaceutical manufacturing plants in Latina, Italy; Istanbul, Turkey; and Toluca, Mexico. Basic manufacturing plants are under construction in Sao Paulo, Brazil, and Buenos Aires, Argentina; additional pharmaceutical manufacturing installations are under consideration.

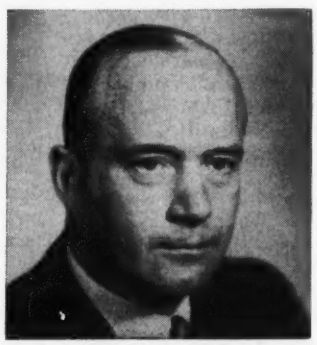
'Capital investment to hit all-time high in 1958'

Stefan H. Baum, Executive Vice President, Reichhold Chemicals, Inc. — Our company does indeed believe that this is a good year to expand. Actually, our capital investment program is going to hit an all-time high for 1958, namely, between $5 and $6 million. This is in contrast to our more recent expansion at the rate of approximately $3.5 million per annum. We expect to keep going at this rate not only for 1958, but also for 1959 and probably 1960.

Major programs going ahead this year are in Tuscaloosa, Alabama, in Hampton, South Carolina, and in Elizabeth, New Jersey.

RCI has a number of new processes which promise products for interesting sales, and which have now matured to the stage where such production capacities have to be constructed.

RCI's sales in standard products or, more importantly, in products which have been introduced during the recent



Stefan H. Baum

years, have expanded to such a degree that additional plant capacity simply has become necessary in order to give prompt RCI service to our many customers. RCI operates 14 plants in the U.S.A. in order to have points of production close to the major markets for its products, and as some of our new lines expand rapidly this diversification alone calls for additional capacity in the various RCI plants.

Most important, however, is the still unfilled gap of requirements for chemicals which RCI manufactures itself under its own processes. RCI's own capacity is still insufficient to cover its requirements, and expansion of production capacity for these captive requirements is a natural step for the company to take.

With requirements for sales to its customers and, as a result, captive needs for its raw materials continuously expanding, RCI believes that it is good business to take advantage of the present conditions in the construction field to avail itself of better prices and quicker deliveries now prevailing.

'Plan $15-million investment in 59'

Archie E. Albright, Vice President, Stauffer Chemical Company — In appraising new plant projects, management must decide not only "whether" to build — but, equally important, "when" to build. Correct timing is often the essential key to profitability. Plants built in anticipation of demand frequently yield the highest rewards, but they can also prove costly speculations if the expected demand fails to materialize. By the same token, construction undertaken too late — after other producers have gained established positions — can prove equally costly.

Moreover, many worthwhile capital projects, postponed pending "clarification" of the market, may be priced out of sight by increased construction costs by the time the green light is finally given. The current recession has posed new problems for many managements in their short-term planning for new capital projects.

Last year Stauffer invested about $14 million in new plant facilities and improvements; this year our expenditures will again be about $14 million. No project, previously approved on its merits, has been deferred because of the "recession."

Our new plant construction may be divided roughly into two categories: 1) plants to make new products developed by our research, and 2) plants to produce older chemicals for which new or expanded markets exist.

As examples of (1), we have constructed this year the first commercial plant to produce our patented organic phosphate pesticide, Trithion, at Henderson, Nevada; a large pilot-plant unit to make our selective herbicide, Eptam (a full-scale commercial plant will be built next year); and a semi-works plant to make columbium and tantalum pentachlorides at Richmond, California.

In category (2) are a large sulfuric acid plant, based on refinery sludge recovery, at Hammond, Indiana; an anhydrous hydrogen chloride plant at Fort Worth, Texas; a unit to produce pelletized super-

Archie E. Albright

phosphate at Richmond, California; and an extensive plant modernization program at Niagara Falls, N. Y.

We had scheduled for 1958 an expansion of our pilot-plant facilities to produce titanium sponge, based on a novel process developed by Stauffer research. In light of present titanium market conditions, however, this project has been deferred.

Construction of other, nonmanufacturing facilities, is also proceeding — an addition to the Research Center at Richmond, California, and a new Design and Engineering Center at the same location. We have also purchased a tract of land, as a potential plant site, near Arroyo, W. Virginia.

We anticipate investing about $15 million in plant expansion and improvements in 1959.

To page 100

It has been said that many of our best minds are working at mediocre jobs, out of preference. Supervision of research, according to this engineer-inventor, is too often unintelligent, misdirected, and blind. The only way to remedy this situation is for management to gain an . . .

Understanding of the True Nature of Creativity and Inventiveness

FRED LICHTGARN
Engineer-Inventor
Northlake, Illinois

Fred Lichtgarn is an engineer-inventor with over 100 inventions to his credit. He has made extensive studies in over 50 projects in chemical, mechanical, electrical, and other scientific fields. A self-starter, as all true creative people are, Mr. Lichtgarn has done much consulting work in manufacturing problems and in the origination of new products. Because he is intensely interested in creativity and the problems of creative people, he makes this plea for a better understanding of the true creative nature.

Why is so much stress placed on teamwork in the research laboratory today? It is simply because the true nature of creativity and inventiveness requires a depth of understanding that does not exist, at present, in private business or in Government.

The group system is a logical one for business-minded executives. The logic is the same as that used to judge the acceptance of automobiles by the consumer. The more horsepower, the more speed — the quicker one can go from here to there (frequently eternity). The longer and bigger the auto, the greater impression it makes. This sort of thinking makes sense and seems reasonable to noncreative directors and supervisors, but research, truly creative research, does not follow this pattern of thought.

True, results are obtained from team research — but the efficiency is woefully low. If the same amount of time, effort, money, and interest were devoted to individual research, the results would be, in all probability, most astounding. I believe this most firmly. Therefore, I am making this plea for more understanding of the true nature of creativity and inventiveness.

When will it be clearly realized that our most important national resource is not any material thing, but rather the ideas that originate in the minds of gifted, creative people? How few seemingly informed, responsible executives realize, for instance, that modern electronic TV was first developed by one young man, working alone, and with limited funds.

The basic development of television was not made in a "1000-manpower" laboratory. True, laboratories of this type did make TV into a commercial success. But their work essentially was an extension of the basic creative results achieved by just one man.

Although the "1000-manpower" laboratories are wonderfully quick to "improve" on the results of lone inventors, they are sadly deficient in developing new ideas.

Another vital example of important creative work done by individuals was the discovery, proof, and demonstration of atomic fission by Dr. Otto Hahn and Lise Meitner. This world-shaking (literally and figuratively) discovery was accomplished by just two gifted individuals working alone, with almost no money. Their whole "lab" consisted of about $500 worth of ordinary apparatus. Yet with this "inadequate" equipment, *plus creativity*, these two researchers opened up a new era in human life.

When will management realize that the creative new idea — really new — is the result of *one man working alone*, or at least semi-independently from the "team." *The team develops ideas, it doesn't originate them.* If a new idea is developed, it will be by one man who has been able, somehow, to steal enough time (generally his own) to think the problem through (from 2 AM to 5 AM most likely) until a faint glimmer of what may be the answer begins to take shape in his mind.

Conformity First

By this time it is 6 AM and he is mentally and physically exhausted. He goes to sleep — the alarm goes off — you know that rules and regulations come first (not new ideas) — so the poor fellow must go to the lab and try to appear eager and industrious for the rest of the day — until he can find the freedom to think for himself again, on his own time.

This "tale" is not as farfetched as it may sound. Unfortunately, it is too often true. And too often also it is the creative person who gets fired for not "being on his toes." Filling out notebooks with inane notes is "constructive effort" — and looks imposing. Everyone is happy, especially the supervisor. No one is idle, no one is wasting time, everyone is doing just what the supervisor has decided he should be doing . . . and just how it should be done. Could anything be more contented? Not even cows!

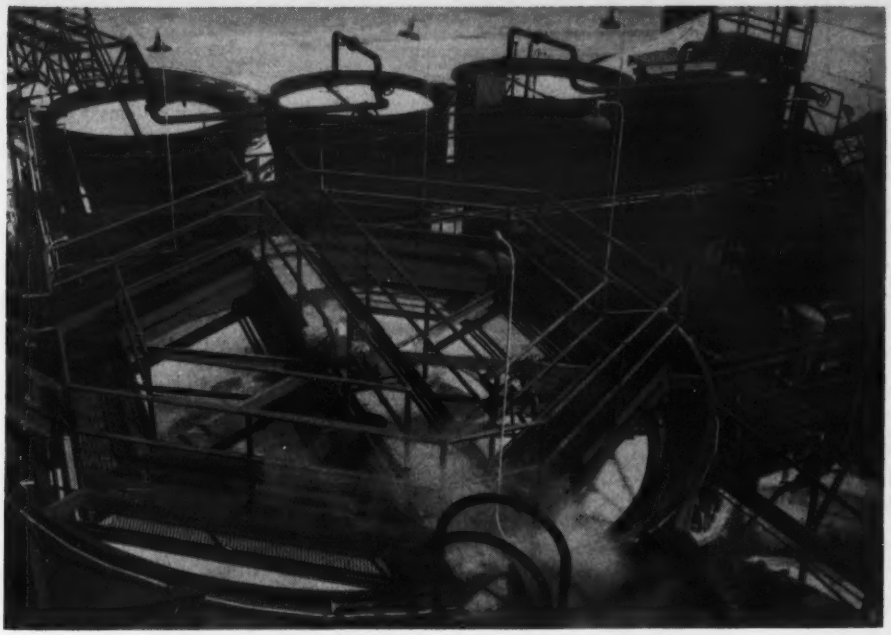
There is something about "teamwork" in a research laboratory that removes all independence of thought, all desire for flight into the airy realm of imagination where new ideas dwell. True creativity is a delicate perception in the outermost regions of the human capacity — and teamwork is rank poison to this struggle. Teamwork means business, hard-boiled business. And business and research simply do not mix.

Supervision Stifles Creation

It takes *work* of a kind that only a few people are aware of to create a new idea. You give a problem to a truly creative person and he becomes *married* to it. They are "one till death do us part."

In sharp contrast to this, the team is well broken in. No one comes up with confusing, new, original changes. No one proposes that a different attack be the better one — and there are no hurt feelings. The lab is running as a well-oiled mechanism should. Where are the

To page 103



Air bubbles float recovered lithium product to top of flotation chamber (foreground) where it is scraped off and deaerated for further processing. First-stage flotation tanks are in background

An increasingly important source of lithium chemicals is burkeite, a mineral by-product of the California potash industry. However, extracting lithium product from the mineral is no simple task. Using an efficient flotation separator together with processing techniques developed at its Trona plant, American Potash & Chemical Corp . . .

Ups Lithium Concentrate Recovery 11%

TED F. MEINHOLD, Associate Editor
with J. W. WALKER, Technical Service Div.
American Potash & Chemical Corporation

Problem: A more efficient method of recovering lithium concentrate (di-lithium sodium phosphate) from saturated burkeite liquor ($2Na_2CO_3 \cdot 3Na_2SO_4$), was sought by engineers at the Trona, California, plant of American Potash & Chemical Corporation. Recovery was erratic — varying from 25 to 50 percent.

Low efficiency not only meant loss of valuable product, but also resulted in higher maintenance costs. Unrecovered material caused buildup of troublesome, difficult to remove lithium scale in pipe and equipment. Amount of scale would increase in proportion to quantity of lithium product remaining in the liquor.

Recovered lithium concentrate is later made into lithium carbonate and phosphoric acid. Recovery from the burkeite liquor was initially performed by series of conventional air-operated flotation cells. Units were equipped with carbon plates in the bottom to obtain a fine dispersement of air bubbles.

In addition to their poor efficiency, the cells were unsatisfactory for other reasons. Carbon plates became blinded with lithium product, Glauber's salt would crystallize on cell walls during cold weather, and a considerable amount of manpower was needed to keep froth removed and the plates acid washed.

Investigation showed that much of the trouble was also due to excessive foam formation in the feed tank preceding the cells. Efforts to beat down the foam failed and much of the material would overflow the tank and become lost. Tests showed that this foam actually contained the majority of the lithium concentrate.

Shortly afterwards, the old flotation cells were abandoned and three additional tanks, similar to the feed tank, were installed. System was hooked up so that the liquor flowed in parallel through the four tanks. Launders were mounted around each tank to catch the foam that overflowed.

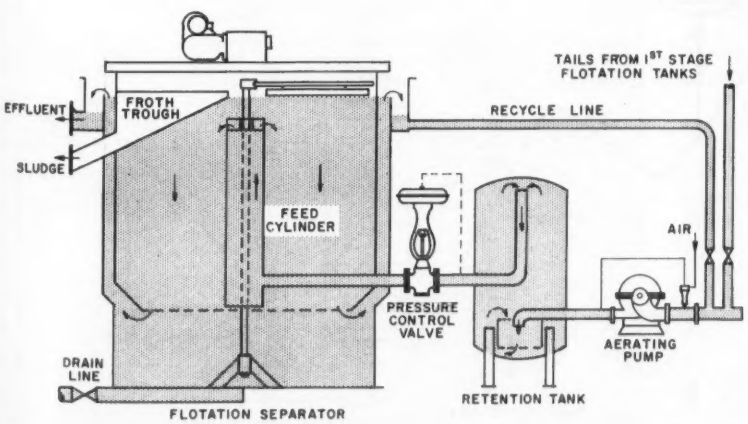
The tanks, although easier to operate and more efficient than the flotation cells, still resulted in a sizable quantity of product remaining unrecovered. Also, lithium product remaining in the tails would blind screens of filters used later in the process.

Solution: After experimenting with various flotation agents and equipment, it was decided to install an additional unit to the system to clarify the tails. A compact, prefabricated, flotation separator was selected for the job. The unit operates on principle of aspirating air into influent at suction side of the feed pump and compressing the mixture in the pump.

Under pressure, air dissolves in the solution. A 1500-gal capacity retention tank provides necessary time and agitation for dissolution of the air.

After two minutes in the retention section, solution en-

To bottom of page 104

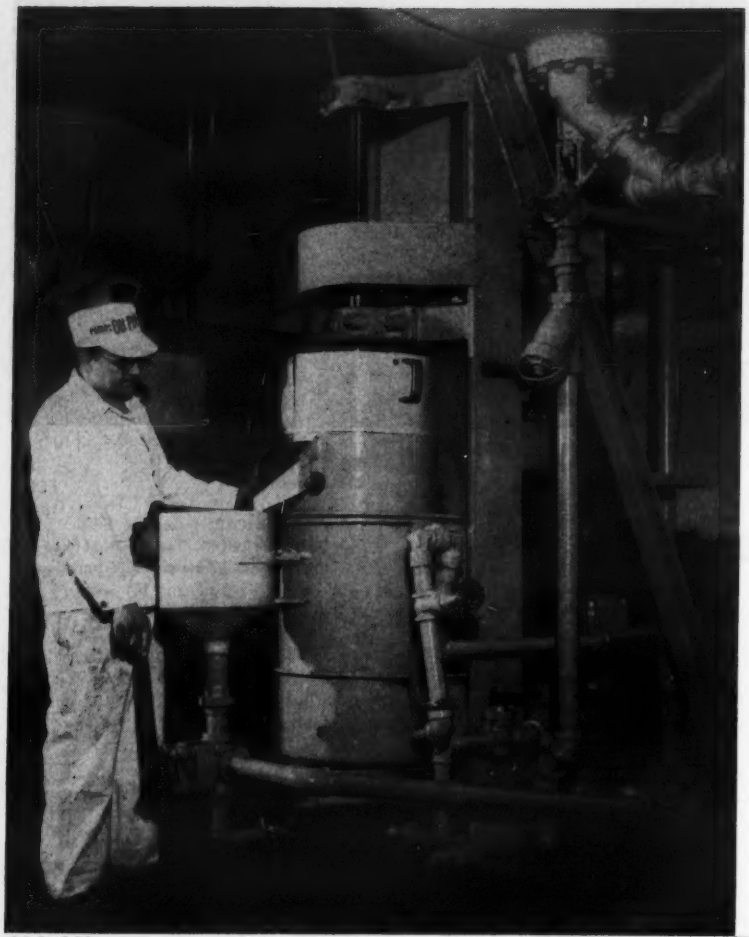


Flow of liquor through flotation separator is approximately 1000 gpm

Low-cost, simple-design dispersion mill has filled gap between ball and roll mills in the paint industry. Developed by Du Pont and already installed in most of their plants, the units are paying for themselves in short order. Operating virtually noiselessly and vibration-free, mill . . .

Grinds Pigments Co

TED F. MEINHOLD, Associate Editor
with **ROGER J. STORVES,** Production Supervisor, Chicago Plant
E. I. du Pont de Nemours and Company, Incorporated



C P Staff Photo

One operator can easily handle five or six mills. Once units are properly adjusted they operate unattended. Photo shows one of the 16-gal units at Chicago plant

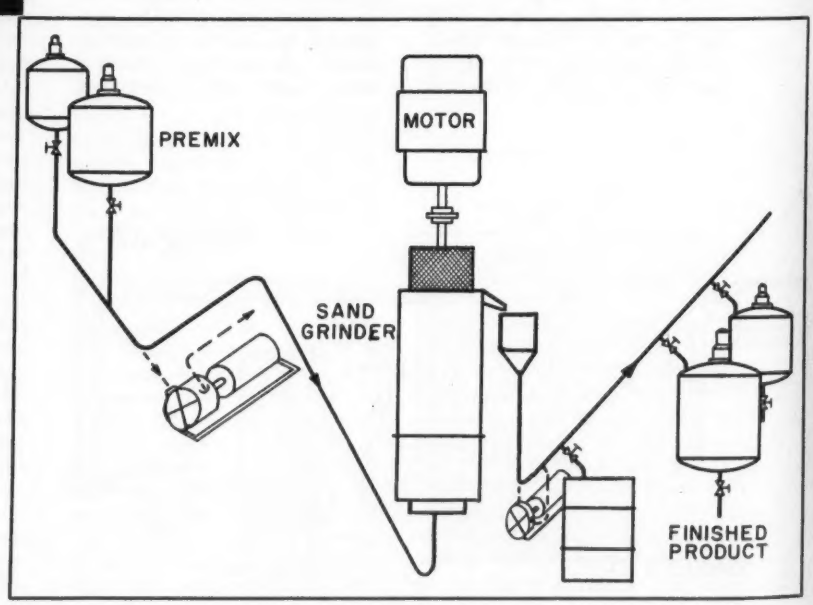
Compact, efficient, continuous dispersion mills — using sand as grinding media — have brought about substantial savings of time, labor, and money in Du Pont's finishes plants as well as in plants of other paint manufacturers licensed by Du Pont to use the process.

As installed in Du Pont's Chicago finishes plant, the "sand grinders", as they are called, have replaced worn-out, space-hogging, conventional pigment dispersing equipment, some of which had been in service over 30 years. Benefits realized from the new mills have been so great that they have paid for themselves in short order.

The plant now has six sand grinders in operation. Total consists of two 16-gal, two 23-gal, and two 30-gal units. As remaining old grinding equipment wears out, this also will be replaced by sand grinders, if formulations permit.

Cost of a sand grinder is low in comparison with other dispersion equipment performing similar operations. Providing a strong dispersive plus mild grinding action, the mill bridges the gap between milling action of roll mills and that of ball mills.

It will grind fine crystalline materials and small, hard agglomerates. Particle size operating range is 0.2 to 30 microns. The unit will efficiently disperse many pigments and pigment combinations. Conversely, it will not handle large solid crystals or tough



Sand grinder equipment arrangement. Unit can be installed in either one-, two-, or three-floor arrangement. Use of two premix tanks permits continuous operation

Continuously — with Sand

agglomerates as a ball mill will. Also, it will not efficiently process heavy, viscous mixtures, as will a roll mill. It will process less viscous fluids, however.

Unit Improves Products

Advantages realized through use of the mills are numerous. Grinding and dispersing various pigmented finishes, the units achieve definite product improvements, particularly with cadmium reds, Monastral blue and green, and iron blues. These improvements include better gloss retention and cleaner color for bright colors, such as chrome yellows and toluidine reds. Phthalocyanine blues and greens have better bronzing resistance. Red and yellow iron oxides show less settling.

Operational savings are reflected in power, grinding media costs, and labor. Du Pont reports that power costs at the Chicago plant have been cut 1/3 to ½ per given volume of production. Not only do sand grinders require less power to operate, but running continuously, their output is much greater than batch-type equipment.

Output rate of a 16-gal mill, using a 20-hp motor, is about 180 gph, producing titanium white dispersion. This is equivalent to two 6 x 6 pebble mills or two 5 x 4 ball mills. With a 30-gal unit, output may be boosted to 400 gph.

Mills use standard ASTM sand, 20-30 mesh Ottawa silica, as grinding media. Cost of this sand is only 5 or 6 cents per lb — considerably less than conventional steel or pebble grinding media. Sand also eliminates possibility of iron contamination to product.

One operator can easily handle 5 or 6 mills. Once units are properly adjusted, they operate unattended, except for occasional checking. Normal procedure is to fill and start mill, set flow to about desired rate, and then adjust mill base and cooling water flow. Unit stabilizes itself in a few minutes.

Installed vertically, the mills take up very little space. They leave plenty of room for storage and other activities, and in general, give plant a neat, overall appearance.

Another big feature is that they operate practically noiseless and vibration-free. This improves working conditions, reduces maintenance, and permits use of much lighter construction both in the equipment and building.

Du Pont Brainchild

Developed a few years ago by Du Pont's Fabrics and Finishes Department, the sand grinder is basically a simple device. Essentially, it consists of a series of hard, flat, steel discs, mounted horizontally on a vertical shaft supported within an upright, water-jacketed steel shell. In operation, shaft rotates at 2000 peripheral feet per minute, which amounts to about 900 rpm on a 16-gal mill. Approximately 1:1 ratio (by volume) of sand to mill base is used. Unit operates at various temperature ranges, usually 120-130°F.

As shaft turns, doughnut-shaped circulation patterns of high turbulence form on each side of discs (see drawing). Large differences in velocity of adjacent layers near disc surfaces produce necessary shearing action. A pigment particle caught between two sand particles in adjacent layers is subjected to a compressive force in any one direction which resolves into a shearing force at a different angle. Other milder actions occur, but this one is the strongest.

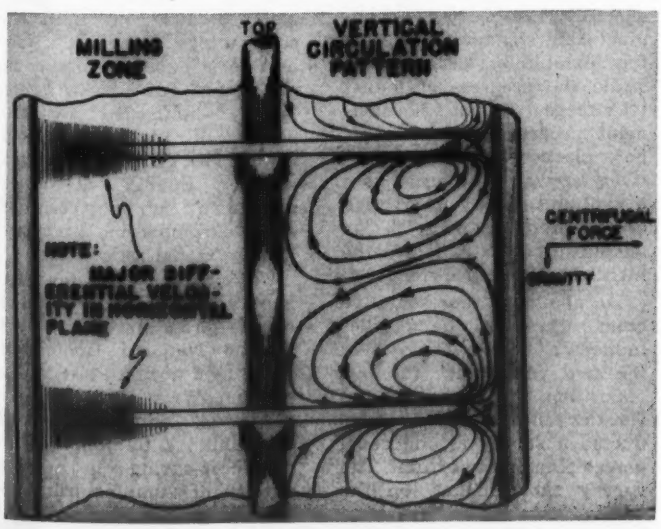
Wear on mill parts is negligible. Sand loss is insignificant. Steel-wire cloth of 35 mesh, or slotted electrolytic plate of comparable mesh, mounted at top of unit holds sand inside mill. Dispersed product leaves unit by gravity. Pigment can be collected in drums, cars, or removed through transfer lines and pumps.

Arrangement Flexibility

When installing the sand grinders, either 1-, 2-, or 3-floor arrangements are possible. Pigment and vehicle combinations are normally premixed before being charged to the mill. Use of two 500-gal premixers with a 16-gal unit permits continuous operation or semi-continuous with different products.

Mills can be washed by running solvent through them with occasional agitation after most of the mill base has been removed. Often the wash solvent can be used in

To bottom of page 41



As shaft turns, doughnut-shaped circulation patterns form on each side of discs. Differences in velocity of adjacent layers near disc surfaces produce necessary shearing action

oust it with a Dow Corning SILICONE DEFOAMER!

When foam moves *in*, efficiency moves *out* . . . production goes down! Costs go up! If foam is hogging space in your plant, knock it down with Dow Corning SILICONE DEFOAMERS . . . most versatile and effective foam killers made!

1 oz kills foam in:

250,000 lb vat dye solution

125,000 lb asphalt

62,500 lb hypo fix and film developer

FREE SAMPLE! Make your own test. Return coupon below for generous *trial sample* of a Dow Corning SILICONE DEFOAMER. No obligation, of course.

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MIDLAND, MICHIGAN

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NAME

TITLE

COMPANY

CITY ZONE STATE

My foamer is

Oil system

Aqueous system

Food products

Other

Check 2149 opposite last page

The Eighth National Plastics Exposition at Chicago's International Amphitheatre will use over 100,000 square feet of display space — a lot of ground to cover. Let CHEMICAL PROCESSING help you pick your spots at the Show with a preview tour of "what's new" in . . .

Plastics For Profits

— Show Preview

Cost-conscious industry will be casting a weather eye toward Chicago's International Amphitheatre, November 17-21. The Eighth National Plastics Exposition with the theme "Plastics for Profits", will have over 205 displays by plastics products manufacturers, raw materials producers, and equipment suppliers.

As stated by John J. Bachner, chairman of the Exposition Committee, "Since plastics have the answers to both quality improvement and cost-saving in a steadily increasing variety of manufacturing industries, the Society expects a record attendance. Every echelon of management is vigorously seeking, testing, and employing materials and methods capable of keeping production costs within profitable bounds."

In addition to stressing technical and competitive advantages of plastics from a manufacturing standpoint, most of the exhibitors will demonstrate the progress of industry's research and development programs. Examples of how plastics are being effectively applied to improve both appeal and quality in creation of new products and re-design of old products will be the highlight of many displays.

To obtain a representative cross-section of the plastics industry's achievements over the two years since the last exposition, the Society of the Plastics Industry, Inc., conducted a survey among companies planning to exhibit. The survey showed that, on the whole, price levels have been maintained in the face of two years of inflationary pressures; in many cases prices are lower.

Also revealed was a broadening array of examples in which plastics have combined with or replaced other materials because of attractive cost-savings provided. New and "first" uses of plastics in the past two years were largely influenced by the ability of plastics to help manufacturers maintain product quality at lower manufacturing costs, or achieve comparable or better quality at the same costs.

The theme "Plastics for Profits" will also be stressed in the program of the 1958 Annual National Conference being held during Plastics Exposition Week. The two-billion-dollar industry's broad contributions to both quality and cost-savings in a wide variety of manufacturing industries will be emphasized.

Plastics Show 'Firsts'

Chemical Processing magazine, to help you best utilize your time at the Exposition, also conducted a survey of exhibitors. Our purpose was to determine what BRAND-NEW products or IMPORTANT MODIFICATIONS are making their DEBUT at the show. Results of our survey are tabulated on the opposite page, according to product classification. On the following page are listed some additional suggestions on stops that will be profitable during your tour of the Amphitheatre.

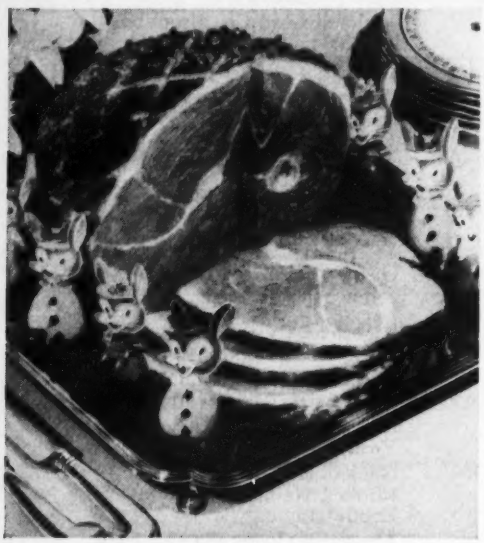
PLASTICS SHOW HIGHLIGHTS

Product	Uses	Features	Supplier
Coatings			
Phenolic Resins	For wax emulsions, paints, inks.	Versatile and uniform.	Durez Plastics Div., Hooker, Niagara Falls, N. Y. Booth 201
Tropiglas Polyester-Fiberglas Mixture	Decorative paneling, insulation.	Tough and durable.	Naugatuck Chem Div., U. S. Rubber, Naugatuck, Conn. Booth 415
Equipment			
Color Printer Model 20-A	Two-color printing of identification, decoration.	Handles cylindrical items.	Markem Machine Co., Keene, N. H. Booth 345
Miniature O-Bracket	Thickness measurement of plastic film and sheet.	Continuous, non-contacting measurement.	Industrial Nucleonics Corp. Columbus, Ohio. Booth 576
Process Analyzer	Frequency distribution thickness curves.	Automatic.	Industrial Nucleonics Corp. Columbus, Ohio. Booth 576
Railroad Hopper Car Vibrator	Unloading all types of particulate materials.	One man operation, quick connecting, no lifting.	Martin Engr. Co., Neponset, Illinois. Booth 145
Screen Process Printer Model 106S	Screen printing identification.	Prints on cylindrical, oval, tapered items.	Markem Machine Co., Keene, N. H. Booth 345
Ultra-Filtration	Provide dust-free air.	High efficiencies, low maintenance.	Wheelabrator Corp., Mishawaka, Indiana. Booth 109
Vacuum Coater LC1-72	Deposition of thin metallic films under high vacuum.	Size (72" diam) permits metallizing large pieces.	Consolidated Electrodynamics Corp., Rochester, N. Y. Booth 152
Foams			
D25-30	Prepolymer polyester for flexible urethane foams.	Economical, uniform.	Witco Chemical Co., Inc. New York, N. Y. Booth 222
Fomrez 50	Polyester for flexible urethane foams.	Fine, uniform foam structure, low density, soft.	Witco Chemical Co., Inc. New York, N. Y. Booth 222
Fomrez 70	Polyester for flexible urethane foams.	"One-shot" foaming, uniform.	Witco Chemical Co., Inc. New York, N. Y. Booth 222
Fomrez R400 Polyester	Rigid urethane foams.	Wide range application foams, easy to use.	Witco Chemical Co., Inc. New York, N. Y. Booth 222
Fomrez P-420	Prepolymer of polyester-toluene for urethane foams.	Provides uniform rigid foams, dimensionally stable.	Witco Chemical Co., Inc. New York, N. Y. Booth 222
Ingredients			
Color Speckles	"Salt-and-pepper" color effects in styrene, acrylics, etc.	Alone or with pigments in opaque or translucents.	Ferro Corp., Cleveland, Ohio. Booth 627
Dutch Boy Invin 91 (Barium-Cadmium Organic)	Vinyl stabilizer for film, sheet, extrusions.	Clarity, high heat and light stability, liquid system.	National Lead Co., Brooklyn, N. Y. Booth 140
Laminating			
Hetron Polyester Resins	Reinforced laminates and custom-molded shapes.	Fire-, corrosion-, arc-resistant, strong.	Durez Plastics Div., Hooker, Niagara Falls, N. Y. Booth 201
Laminac 4150 Polyester Resin	Hand lay-up of structures.	Minimum drainage, sagging.	American Cyanamid Co., New York, N. Y. Booth 540
Laminac 4106 Polyester Resin	Dual-spray gun application.	Rapid wetting, no sagging.	American Cyanamid Co., New York, N. Y. Booth 540
Vibrin X-1109 Styrene Polyester Resin	For Twin-nozzle spray applications.	Thixotropic, fast wetting.	Naugatuck Chem. Div., U. S. Rubber, Naugatuck, Conn. Booth 415
Molding			
Cymac 325 Methylstyrene	Electrical and electronic applications.	Stable under humid conditions, resists cold flow.	American Cyanamid Co., New York, N. Y. Booth 540
Delrin Acetal Resin	Mechanical parts.	Resistance to creep, solvents, deformation, and abrasion.	E. I. du Pont de Nemours, Wilmington, Del. Booth 414
Impact Cymac Methyl Styrene	Extrusion, injection molding.	Low cost heat resistance, impact strength.	American Cyanamid Co., New York, N. Y. Booth 540
Kralastic HTHT Rubber-Resin Blend	Molded articles.	Heat resistance, high tensile strength, good impact.	Naugatuck Chem. Div., U. S. Rubber, Naugatuck, Conn. Booth 415
Laminac 4103 Polyester Resin	Molded products.	Tough, resilient resin.	American Cyanamid Co., New York, N. Y. Booth 540
Laminac 4107 Polyester Resin	Molded parts.	Chemical resistance, no crazing in thick sections.	American Cyanamid Co., New York, N. Y. Booth 540
Penton Chlorinated Polyether	Injection molded valves, fittings, pump parts, pipe.	Resists thermal degradation, 220°F or higher.	Hercules Powder Co., Wilmington, Del. Booth 436
Phenolic Molding Compounds	For industrial parts.	Smooth finish, chemical and heat resistant.	Durez Plastics Div., Hooker, Niagara Falls, N. Y. Booth 201
Pro-fax Polypropylene	Molded parts, sheeting, film.	Maintains rigidity above boiling water temp, light.	Hercules Powder Co., Wilmington, Del. Booth 436

See following page for other show highlights

HOW *HERCULES* HELPS...

SET NEW STYLES IN PLASTICS—Diadem's new "Hairtainer," a multispring comb adaptable to any hair style, dramatizes the unique combination of resilience and rigidity offered by Pro-fax®, Hercules polypropylene, lightest of all plastics. Pro-fax is setting new standards for plastics where lightweight, exceptional heat resistance, chemical inertness, toughness and styling are essential.



ENHANCE COUNTRY-CURED FLAVOR IN HAMS—HVP®, Hercules hydrolyzed vegetable protein, is helping ham packers capture the elusive old-fashioned, slow-cured flavor in modern hams. Manufactured from nutritious wheat, HVP in liquid form can be easily added to regularly prepared cures to add a pleasant and distinctive flavor.

WORK WONDERS IN KITCHENS—The appearance of fine wooden kitchen cabinets is greatly enhanced by finishing them with nitrocellulose lacquer. Another reason why Henry M. Carr, Inc., Frankfort, Ind., applies a lacquer finish to birch cabinets such as these is to gain rapid air-dry. No baking equipment is needed to provide a tough, durable finish.

HERCULES POWDER COMPANY
INCORPORATED
900 Market Street, Wilmington 99, Delaware

CHEMICAL MATERIALS FOR INDUSTRY

HERCULES

G58-8

Check 2150 opposite last page

PLASTICS SHOW PREVIEW

From preceding page

While you are visiting the International Amphitheatre we suggest you include these stops on your itinerary.

Chemore Corp. (Booth 523). Montecatini's latest in polyolefins: Films, monofilaments, staple fibers, fabrics.

Catalin Corporation of America (Booth 449). Molding compounds, polystyrene and acrylonitrile-styrene, polyethylene, nylon; industrial laminating, bonding, and impregnating resins; UV absorbers and antioxidants.

Diamond Alkali Co. (Booth 208). Complete line of PVC resins covering entire useful range of molecular weights. Copolymer resins and specialty compounds.

Emery Industries, Inc. (Booth 100). Plastolein plasticizers for vinyls: Azelate esters for low temp; polymerics for permanence. Empol dimer acid for urethanes.

Exact Weight Scale Co. (Booth 122). Weigh-feeder equipped with automatic plunger position control; Shadograph scales; net weigher.

Koppers Co., Inc. (Booth 409). Dylene polystyrene; Dylite expandable polystyrene; Dylan polyethylene; Super Dylan high-density polyethylene.

Monsanto Chemical Co. (Booth 300). "Space tunnel" will display products and processes in a series of "space stations", including vinyls, styrene, adhesives, coatings.

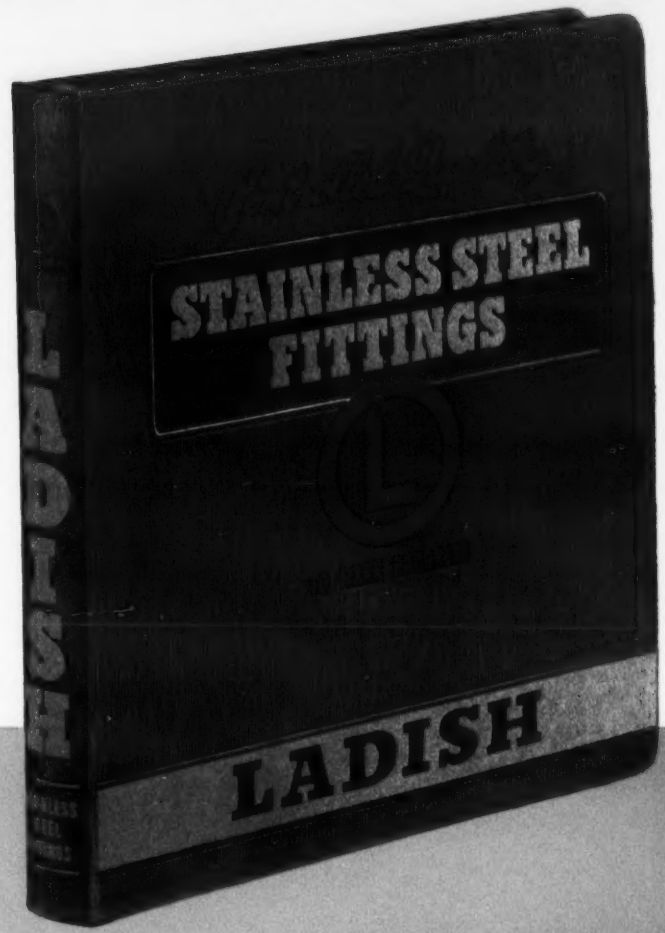
Pittsburgh Coke & Chemical Co. (Booth 209). Phthalic anhydride, maleic anhydride and fumaric acid; phenol, orthocresol and meta-p-cresol; PX plasticizers.

U.S. Industrial Chemicals Co. (Booth 501). Live tests on Petrothene resins demonstrate quality control as a joint responsibility of supplier and customer.

For more information on product at right, specify 2151 . . . see information request blank opposite last page.

NEW LADISH CATALOG

GIVES DETAILED SPECIFICATIONS, DIMENSIONS AND ORDERING INFORMATION ... PLUS USEFUL TECHNICAL DATA ON COMPLETE LINE OF STAINLESS STEEL PIPE FITTINGS



This 86-page Ladish catalog and technical data manual provides information vital to all who specify, purchase or install stainless steel pipe fittings.

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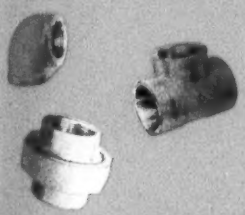

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- **FLANGES – ASA, MSS, LIGHT TYPE AND CORROSION WEIGHT**
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In addition to these special features, "Buffalo" High Temperature Pumps bring you the famous "Buffalo" hydraulically efficient impeller and casing design. Accessibility, dependability and long, maintenance-free life are important *extra* values in every "Buffalo" Pump.

Whatever your heat transfer problem — including vapor phase — phone your "Buffalo" engineering representative for full information.

Only "Buffalo" Pumps bring you the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.

BUFFALO PUMPS

Division of Buffalo Forge Co.

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Canada Pumps, Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

"Buffalo" PUMPS

Check 2152 opposite last page

Increased farm income may boost chemical profits in spring

WILLIAM CLARKE
Associate Editor

If the weather is at least average next spring — not too dry or wet, cold or warm — consumption of fertilizer should soar to a high of at least seven to ten percent over 1958. So say some experts who have been watching signs that augur the near future of this basic chemical industry. And this optimistic viewpoint may well turn out to be exactly correct.

Everything seems to point in this direction. Farm income for 1958 is up by about 15%. An increased amount of acreage will undoubtedly be farmed. The educational level among farmers concerning fertilizer use has been rising.

And the marketing savvy among fertilizer manufacturers has been increasing. Monsanto, for example, has been formulating mixed fertilizers with an IBM 702 computer for over a year now — and saving money for its customers in the process. Other fertilizer manufacturers may also be using computers shortly to calculate nutrient formulations at rock-bottom prices and making sales efforts much more effective.

One Expert's Opinion

With money jingling in the pockets of the farmer, says Dr. M. S. Williams, chief agricultural economist for the National Plant Food Institute, he "will be in a better financial position to buy fertilizer in 1959, if convinced it is the thing to do. Ground-moisture levels should be very favorable for the fertilizer in 1959, since many parts of the country have had ample rainfall in 1958 after several dry years. Also, the acreage of cash crops — especially cotton — should be up in 1959 over 1958. And finally, consumption of plant food has continued to increase even in periods of declining agricultural incomes, mostly because farmers have become aware of the importance of proper fertilizer use."

Of course, other observers have different opinions. One spokesman for a large company in the field believes a one to two percent increase over last year's results may be more realistic. He cites over-capacity as being the underlying cause for the unsatisfactory financial results of the 1957-58 season. But even this observer says Dr. Williams could be close to the final results with today's improvement in farm income and the changes in the farm program.

Only a few depressing influences are expected to have any influence on the demand picture in 1959. One of these is the intangible factor as to how increased carry-over of major crops may cause some farmers to hesitate in adopting better fertilization practices. Another is the expected drop in payment for new conservation practices from 80 to 50% of the cost under the Soil Bank Act.

Importance of Fertilizer Industry

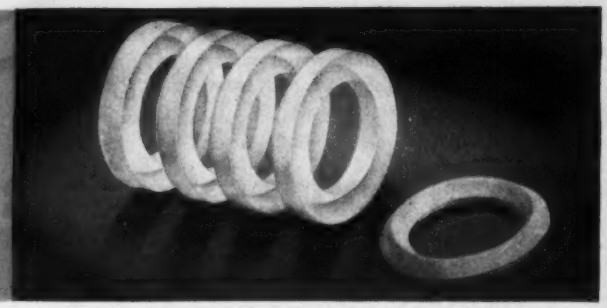
First, this sector of the chemical processing field accounted for over a billion dollars of the $24 or 26-plus billion gross sales attributed to the chemical industry in 1956. Another bench-mark of its importance is that it is the major user of sulfuric acid, ammonia and other nitrogen products, phosphoric acid, and potassium chloride produced in the United States. And tonnage-wise, fertilizer products account for a larger portion of the chemical industry than sales-dollar figures indicate, because of the relatively low value of the final product.

After rather a discouraging

CHEAPEST PACKINGS in corrosive service

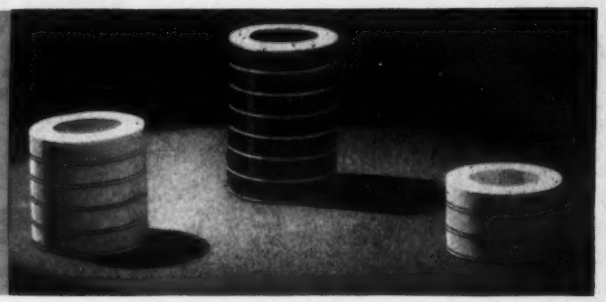
cost less per month of life
cost less in shutdown time
cost less in maintenance labor

VALVES



Chemiseal† Valve Packings, made of du Pont TEFLON, are available in V-type, diagonal, triangular, conical and Garlock Chevron* ring designs. They last months and years in chemical services where other packing materials fail in hours. They seal at low gland pressure and reduce torque required to operate the valve.

PUMPS



Chemiseal Pump Packings offer remarkably trouble-free service and useful life many times that of other type packings.

Molded from pure shredded TEFLON with TEFLON suspensoid, Garlock No. 9167, for positively non-contaminating service. (Also supplied graphited for general chemical applications.) They provide a low friction 2-way seal not only preventing axial seepage but seal against both shaft and stuffing box as well.

†U.S.G. trademark
*Garlock trademark

For prompt service, contact one of The Garlock Packing Company's 30 sales offices and warehouses throughout the U.S. and Canada, or write

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United States Gasket — Plastics Division of GARLOCK

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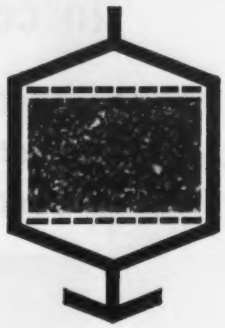
purifies liquids and gases; eliminates tastes, odors, chlorine, and a wide range of contaminants from liquids and solutions. Decolorizes and deodorizes liquids. Raises the standards of purity for many industrial gases. Removes undesirable impurities. Permits recovery, re-use, or resale of by-product gases. Effective for difficult gas separations. Save on heating and cooling by recirculating air through activated carbon filters. Improve comfort and safety in living and working spaces.



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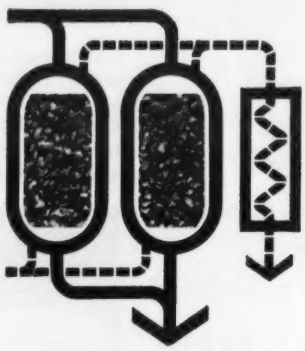

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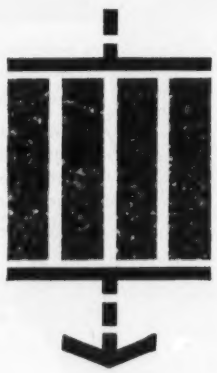
catalyzes and serves as a catalyst support. Speeds oxidation-reduction reactions, chlorinations, and hydrogenations—the key to vinyl chloride production. We supply all grades of activated carbons made to strict quality standards and provide prompt regeneration service. Barnebey-Cheney, Columbus 19, Ohio.



Write for Literature Group J-46.

Barnebey Cheney

Check 2154 opposite last page

sales record early this year because of the late spring in many areas, accompanied by a heavier than normal rainfall, the industry saw deliveries take a sudden jump in May and June. This overcame to some extent the earlier losses experienced. Yet many of the producers reported that profit margins were hurt. Fertilizer manufacturers supplying some areas of the country did show an overall improvement over the previous year, but others, especially in the Southeast, had reason to complain.

Competitive conditions in the industry have caused some price reductions. Monsanto chopped its ammonium nitrate price by $2 a ton, down from $72, effective the first of August. Yet prices have held on many of the smaller-volume products, such as ammonium sulfate.

With price softness on ammonium nitrate, said to be a reflection of the over-supply situation, has come an increasing awareness of the competitive strength of the cooperatives. Not subject to the usual corporate taxes, the cooperatives are able to sell at a lower price and thus maintain desired volume, contributing to the price squeeze on the corporate chemical producers.

Though preliminary estimates indicate 1957-58 tonnage will be down from the

"Houle, I want my boy to start at the bottom, so teach him all you know."

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The manufacturer of an ACID CLEANER who displays this label on his product indicates he is using the finest Corrosion Inhibitor available.

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Check 2155 opposite last page

previous year, the brightening prospects for the current year have caused fertilizer producers to view the immediate future with more optimism and equanimity.

Future Looks Good

Typical confidence in the long-term status of the industry is such that R. P. Westerhoff, of the management and consulting firm of Ford, Bacon & Davis, Inc., anticipates the synthetic ammonia industry will have to increase capacity by about 80% to meet farm and industrial demands by 1975. At today's costs, this will represent a capital investment of approximately $450 mililon.

Another trend of major importance is the consistent increase of plant-nutrient content of fertilizers. The average concentration for the United States has gone from 27.90% in the 1954-55 season to a figure something very close to 30% in 1957-58, up again from weighted average of 29.30% in 1956-57. As would be expected, sale of more highly concentrated mixtures will aid the long-term profit picture.

Sand Mill

From page 35

the next batch of the same or closely related product. Scheduling sequence can also be arranged to minimize clean-out requirements since unit only holds small amount of product.

(Further information about sand-grinder dispersion mills may be obtained from Patent Section, Fabrics and Finishes Department, E. I. du Pont de Nemours & Company, Incorporated, Wilmington 98, Delaware. The process is covered by U.S. patent 2,581,414. Licenses to operate the process commercially are available. Several equipment fabricators have been authorized to manufacture commercial units for Du Pont licenses.)

Check 2156 opposite last page.

PETRONATE

(Reg. U. S. Pat. Office)

. . . the oil-soluble petroleum sulfonate for all four major functions . . .

- **A** Emulsification and Dispersion of Liquids
- **B** Dispersion and Wetting of Solids
- **C** Wetting and Dispersion of Liquid-Solid Systems
- **D** Inhibition of Rust and Corrosion

PETRONATE is the general trade name given by Sonneborn to its various types and grades of oil-soluble petroleum sulfonates.

The chart suggests the broad range of uses for this material. A laboratory sample of PETRONATE will help you determine how its many advantages can be put to efficient use in your manufacturing processes.

Check the coupon below indicating the use intended so that we can send you the proper type of PETRONATE.

USES OF PETRONATE

APPLICATION	PRIMARY FUNCTION OF PETRONATE	SECONDARY FUNCTION
EMULSIFICATION AND DISPERSION OF LIQUIDS		
1. Insecticide Emulsions	Emulsifying Agent for Toxicant	Spreading Agent
2. Textile Oils	Emulsifying Agent for Textile Processing Oils	Wetting and Dispersing Agent for Textile Fibers
3. Leather Oils	Emulsifying Agent for Leather Processing Oils	Wetting and Dispersing Agent for Leathers
4. Drilling Mud	Emulsifying Agent for Oil	Surface Tension Depressant
DISPERSION AND WETTING OF SOLIDS		
5. Rubber Manufacture	Thermo Plasticizing Agent	Increases Dispersibility of Filler
6. Fuel Oil	Keeps Sludge in Suspension	Prevents Segregation of Moisture
7. Printing Ink Manufacture	Aids Dispersion of Pigment	Reduces Viscosity of Ink
8. Ore Flotation	Flotation Reagent	Selective Wetting Agent
9. Additives for Lube Oil	Acts as Detergent	Inhibits Bearing Corrosion
WETTING AND DISPERSION OF LIQUID-SOLID SYSTEMS		
10. Crude Oil Emulsion Splitting	Reverting Agent for Water-in-Oil Emulsions	Aids in Wetting out Salts and Solids
11. Emulsifiable Solvent Cleaners	Dispersing Agent for Oil and Grease Deposits	Acts as Emulsifying Agent
12. Dry Cleaning Compounds	Linking Agent for Water and Solvent	Loosens Dirt Absorbed by Fabric
13. Fat Splitting Process	Dispersing Agent for Solid Fats	Acts as Wetting Agent
INHIBITION OF RUST AND CORROSION		
14. Corrosion Preventive Compounds	Rust and Corrosion Inhibiting Agent	Acts as Moisture Barrier
15. Anti-Freeze Solutions	Rust and Corrosion Inhibiting Agent	Aids in Dispersion of Scale
16. Soluble Cutting Oils	Emulsifying Agent for Mineral Oil	Rust Inhibitor

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Company_____

Address_____

City_____ P.O. Zone_____ State_____

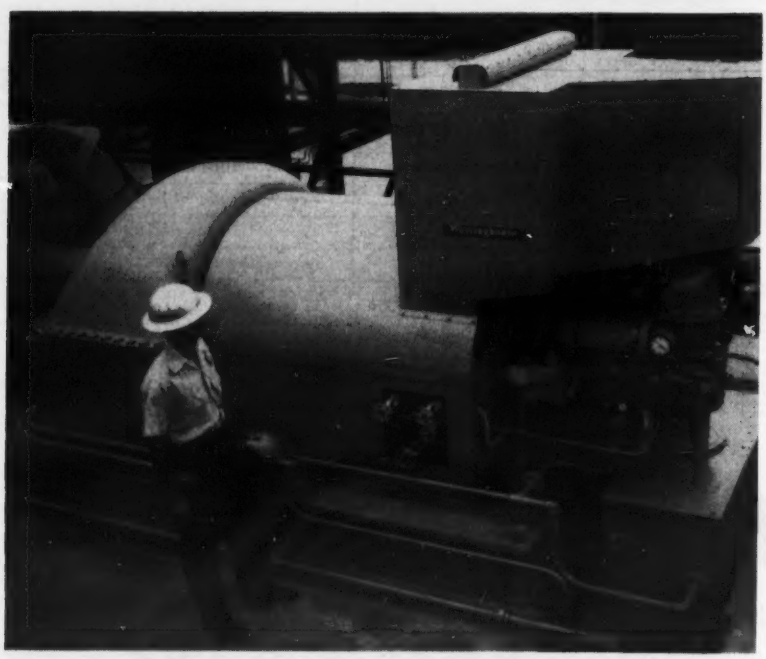
Check 2157 opposite last page

Compressor-Turbine Units Provide Dependable Performance In Petrochemical Plant

Installation marks first use of axial compressors in petrochemical field

GORDON WEYERMULLER, Petrochemical Editor
with **J. L. BATES,** Plant Engineer
Texas Butadiene & Chemical Corporation
Channelview, Texas

One of two identical lines of compressor-turbine units at Texas Butadiene



Multi-stage steam turbine used to drive centrifugal gas compressor. Fully hydraulic governing, accurate alignment, and use of stainless steel where required assure uninterrupted operation and freedom from corrosion

Photos by CP Staff

At the petrochemical plant of Texas Butadiene near Houston, eight compressors and their driving turbines play a key role in the heart of the butadiene process. Compressor-turbine system was placed in operation in early 1957. The units have given satisfactory service.

However, it isn't always this way. Petrochemical plants have been designed with non-standard compressor-turbine units. In some cases problems have been encountered in manufacturing such equipment that meant many months delay in delivery. In other cases units did not operate as expected. This could easily mean a loss of many thousands of dollars or even millions of dollars to the petrochemical manufacturer and his customers.

This dependability of performance achieved at Texas Butadiene has permitted plant to run at full capacity making butadiene, butylenes, and butenes for use in synthetic rubber, aviation gasoline, and organic chemicals.

Plant has a dual setup with two sets of identical plant facilities. Each section has two axial and two centrifugal compressors, making eight in all. Each compressor is driven by steam turbine best suited for it. Although the compressors and turbines are standard, they have a number of unusual features.

Compressors

Use of two axial compressors in each line had provided a number of advantages. An axial compressor operates with an efficiency of at least 8 to 15% higher than most other types of compressors. Inherently higher speed of the axial unit favors optimum operation of the turbine drive. It is smaller in size and weight than other comparable units.

Axial compressors used for

air have space in both rotating and stator elements for addition of two more rows of blades should they be desired. This will enable discharge pressure to be increased from 28.2 to 36.2 psia. Rotor has an extended shaft to accommodate a turbine driver to supply more power for the higher discharge pressure.

Both axial and centrifugal compressors used for reactor gas employ water injection to keep compression temperature below 225°F to prevent polymerization. Each of these machines is also provided with blade and impeller washing apparatus to remove any deposits that might be formed from abnormal operating conditions. Units can be cleaned while operating.

Axial and centrifugal compressors used for first two stages of reactor gas employ water-buffered labyrinth seals. Water is introduced under pressure into a central port of seal. After being collected in an inner and outer drain connected to other ports in labyrinth, water is recirculated. For the high-pressure third stage reactor gas compressor — floating-ring, double-bushing, oil-buffered seals are used. Shaft seals on air compressors are a standard labyrinth type.

Turbines

The steam turbines have a number of design features that account for their dependability. Operation of the oil-relay governor is based on a frictionless speed-sensing element with no wearing parts. Governor assures steady operation of unit. Servomotor actuates steam admission valves in response to governing oil pressure changes. Complete hydraulic design of governor provides long-time accuracy.

Correct alignment of turbine shaft is maintained by centerline support at both governor and exhaust end. Steel-backed, babbitt-lined bearings at both ends provide adequate support for rotor. Thrust bearing of Kingsbury type on governor end maintains accurate axial alignment.

Carbon ring glands held by stainless steel garter springs provide protection against steam or air leakages. Labyrinth interstage seals are also used. Shaft is protected at gland zones by stainless steel facing.

Rotor consists of a heavy steel shaft, with a number of steel discs shrunk and keyed to the shaft. Rotor is statically and dynamically balanced after assembly. Valve-lift bar passes through nitrided steel bushings that assure low friction and freedom from sticking.

Part in Process

Butadiene is produced at the plant by passing a butane-butene mixture of hydrocarbons over a catalyst in a number of Houdry reactors operating in parallel under vacuum. Units operate on a 21 min cycle — consisting of 9 min on production, 9 min regeneration, and 3 min for purge and valve operation.

Each identical set of plant facilities has seven reactors. Each parallel setup contains four compressor-turbine units in a line which service the reactors.

Unit farthest from panelboard is a five-stage, uncooled axial compressor used to furnish regeneration air for catalyst in reactors. Compressor is driven by a multistage steam turbine. This compressor furnishes 152,000 std cu ft air/min, discharging at 28 psi abs. Air is heated to 1200°F before it goes to reactors.

As this heated air goes through catalyst bed, it burns carbon off of catalyst and and heats the catalyst bed. The hot air passes through a waste heat boiler. For each Houdry unit regenerated, 250-psi saturated steam is generated at rate of 100,000 lb/hr for use elsewhere in plant.

Turbine driving the air compressor operates on 580-psi steam at 690°F. Steam is exhausted into a condensor at 5" Hg absolute pressure. Condensate is recovered and goes to boiler feedwater.

Next three compressors in line handle 117,000 lb/min of reactor gas in three stages. These units take the reactor effluent gas (mainly butadiene, butylene, and butane) at 2½ psia and compress to 145 psig. Inter and after coolers are used to keep gas from getting too hot. Liquid knockout drums are provided between compressors.

First unit handling reactor gas is an 11-stage axial compressor. Second gas compressor is a five-stage centrifugal unit and third gas compressor is a three-stage centrifugal unit. All three gas compressors are driven by multistage turbines under same steam conditions as unit used with air compressor. To reduce starting hp, last compressor handling reactor gas is started first, followed by other units for reactor gas.

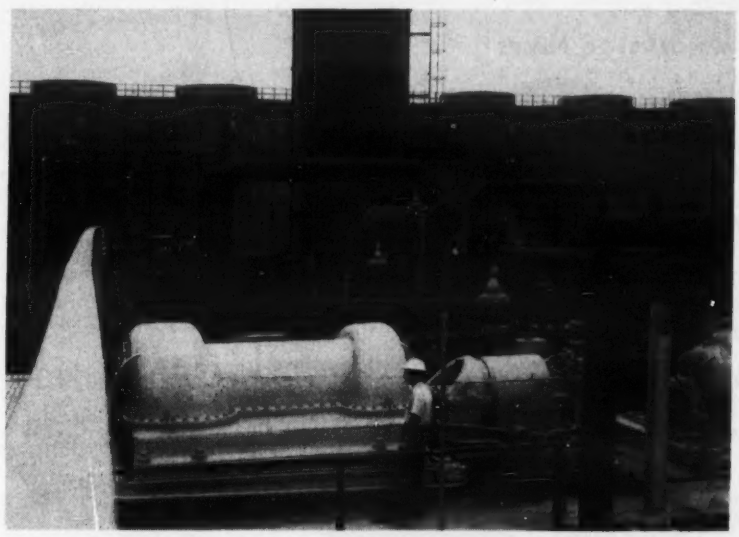
Since each group of four machines operate together, it was possible to supply lubrication for both compressors and turbines in each group from one combined package lube unit. (See article starting on page 106, August 1958 CHEMICAL PROCESSING. This cut costs for lube systems 50%.

Ammonia injection is provided for the gas compressors to hold pH at 6-8, thus avoiding formic acid corrosion.

If pH were to go above 8, admiralty tubes in exchangers would corrode.

(Axial and centrifugal compressors are products of Allis-Chalmers Mfg. Co., PO Box 512, Milwaukee 1, Wis.)

Check 2158 opposite last page.



This 11-stage axial compressor is first stage of three-stage reactor gas system. Unit features pre-injection for polymerization prevention and blade washing

(Multi-stage steam turbines are product of Westinghouse Electric Corp., 3 Gateway Center, PO Box 2278, Pittsburgh 30, Pa.)

Check 2159 opposite last page.

(Texas Butadiene plant was engineered by The Fluor Corporation, 2500 S. Atlantic Blvd., Los Angeles, Calif.)

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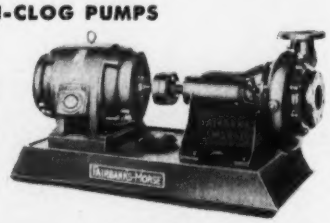
liquid circulation
low-viscosity liquids
boiler feed
cooling towers, etc.

Up to 900 gpm., pressures to 525 ft. Close-coupled pump and motor units mount horizontal, vertical or angular. Sizes ¾″ through 5″.

F-M NON-CLOG PUMPS

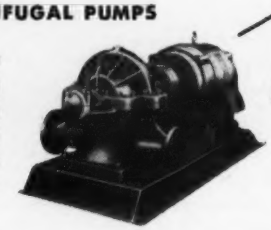
plant waste
slurries
paper stock
fruit
fish
vegetables, etc.



Up to 30,000 gpm., pressures to 175 ft. Sizes 2″ through 20″. Vertical or horizontal. Bladeless or conventional.

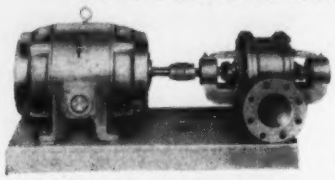
F-M SPLIT-CASE CENTRIFUGAL PUMPS

water supply; plant service
booster; circulating
air conditioning
refrigeration
chemical liquids
boiler feeds, etc.



Up to 50,000 gpm., pressures to 700 ft. Sizes 1½″ through 36″. Single stage or multistage.

F-M WESTCO PERIPHERAL PUMPS



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condensate return
hot and cold liquids
chemicals
refrigerants, etc.

Up to 200 gpm., pressures to 900 ft. High pressure at normal operating speeds. Handle widely varying heads with little change in capacity. Sizes 1¼″ through 2½″.

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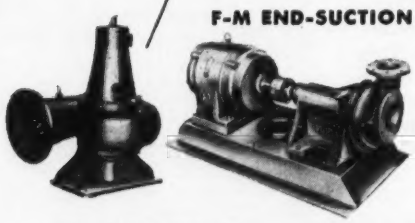

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cooling towers
condenser circulation, etc.

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Check 2160 opposite last page

Neville maintains quality of resin by vertical-plate pressure filtration

Horizontal-plate scavenger saves $1000/month

Problem: Some foreign particles were present in new raw material which Neville Chemical Company, Pittsburgh, Pa., started using for a portion of resin manufacture several years ago. These, as well as charred resin from local overheating and other extraneous material, had to be removed to insure a high degree of purity in Neville's resins.

CP Staff Photo

Two vertical filters at Neville Chemical. Small horizontal-plate filter is located between units, on other side

For all these reasons, plant supervisors decided it was desirable to filter resin in last stages of process.

Solution: Plant installed two vertical pressure-leaf filters in resin line. Resin is collected in one of several kettles, then pumped through one of the filters. From filter, liquid resin is either transferred to drums to solidify or goes to belt conveyor for flaking. (See page 48 for article on cooling and flaking operation.)

Filter is constructed with double-faced filter elements mounted vertically on a pipe manifold, located near bottom of pressure tank. Resin is introduced into tank at 75 psi and is forced through the 100-mesh, stainless screen filter elements. Square-mesh screen has been found to be most suitable. Clarified liquid flows

to interior of leaf. It is discharged through a nozzle at bottom into filtrate manifold outlet.

After filtration, unit is washed with solvent sprayed from nozzles in head of filter. Foreign material is removed through quick-opening manifold at bottom. It is necessary to take filter apart only once every six months for cleaning.

After vertical filters were placed in service, a small horizontal-plate scavenging filter was installed to permit plant to filter resin remaining in bottom of large filters. No heel is left in this small unit at end of filtration cycle.

Results: Filters furnish a clear high-quality product of excellent clarity. Stainless filter elements prevent rust contamination.

Addition of the small horizontal scavenging filter has resulted in recovery of about 36,000 lb of material per month. This means a saving of over $1000 per month.

(Vertical filters and horizontal-plate filter are products of Niagara Filters Div., American Machine & Metals, Inc., East Moline, Ill.)

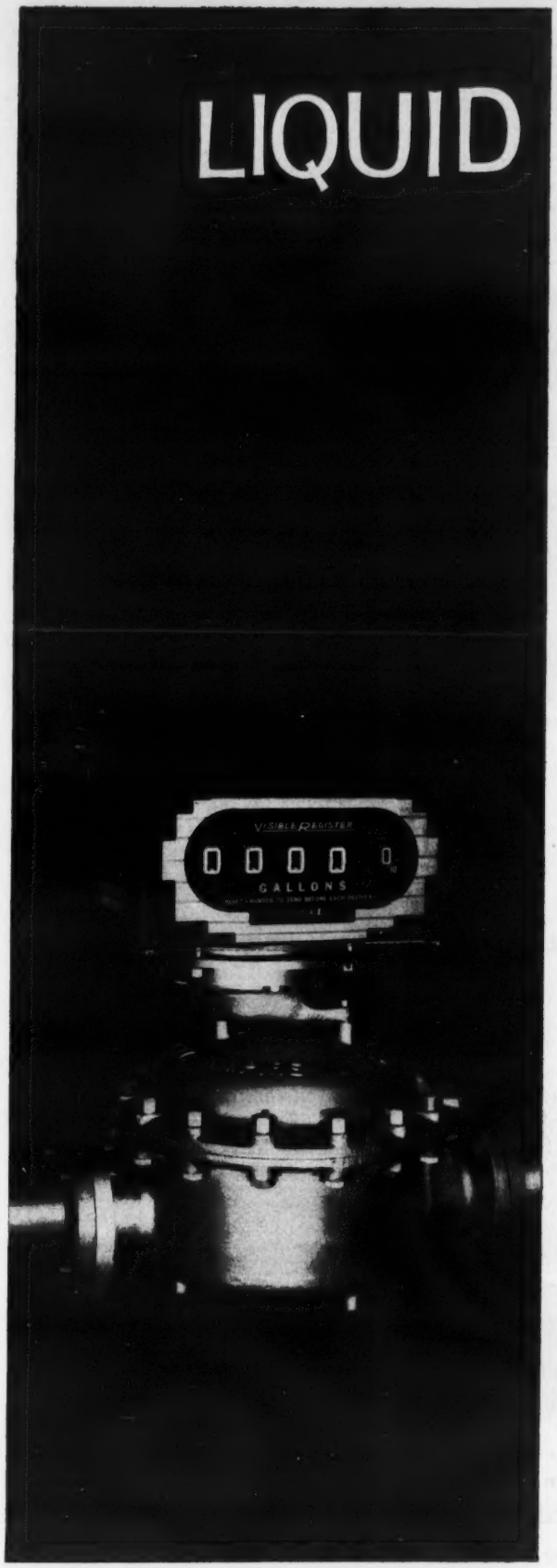
Check 2161 opposite last page.

Repair costs cut at Du Pont by Teflon closure face that doubles valve life

Exposure to lead hazards reduced for personnel

Problem: Soft metal in metal-faced valves, while assuring tight seat in service at various gasoline blending plants of E. I. du Pont de Nemours & Co., was easily extruded by forceful closure of the valve. Also, the woven fiber packing used tended to dry out, causing difficult operation and requiring periodic tightening of packing gland to prevent leakage. Valve often needed repacking before closure disc needed replacement.

Faulty valve operation accounted for as much as 25% of all operating complaints at the blending plants. Exposure of personnel to hazards of tetraethyl lead was another



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Pipe Size _____"
Working Pressure _____ psi Temperature _____ °F max.
Max. Flow Rate _____ gpm Min. Flow Rate _____ gpm
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Check 2162 opposite last page

difficulty caused by the faulty valve operation. The material is insoluble in water and easily absorbed by the skin.

Solution: "Teflon" TFE-fluorocarbon resin was substituted for metal as the closure face in valves controlling flow of tetraethyl lead. Tests were conducted for several years at widely scattered locations serviced by Du Pont using the Teflon closure-faced valves.

Results: Equipping valves with "Teflon" TFE-fluorocarbon resin is expected to double their useful life. As far as maintenance is concerned, at one test installation the Teflon-faced valves were still in satisfactory condition after 60 days of service in a location where metal-faced valve discs failed in 1½ days due to forceful closure.

Even more important than dollar savings, is the fact that the new valves, simply by wearing longer and reducing frequency of repair, reduce possibility of workers' exposure to the hazards of tetraethyl lead.

(Further information about Teflon TFE-fluorocarbon resin may be obtained from E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.)

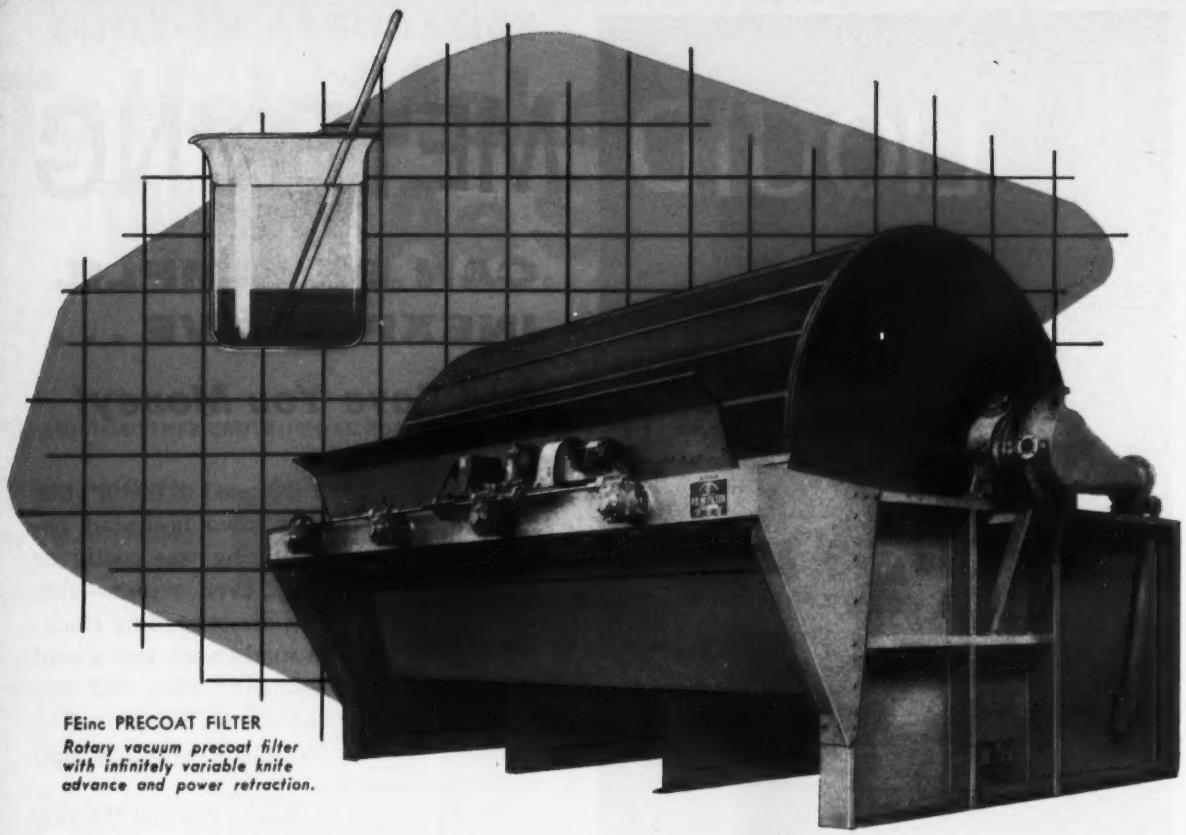
Check 2164 opposite last page.

Pipe covered faster using insulation with built-in tie wires

Simplifies work and reduces waste of material

Problem: Material cost was high and valuable time was wasted in tedious hand tying of lacing wire during the installation of pipe insulation at Esso Standard Oil Company's Bayway Refinery. Installation was also slowed because wires had to be cut and threaded individually on the conventional blanket-type insulation.

Solution: A blanket-type mineral wool material having built-in tie wires was selected to insulate a 150°F, 10″ fuel oil line and its two 350°F steam tracers. Manufactured from spun mineral wool, material has an outer surface faced



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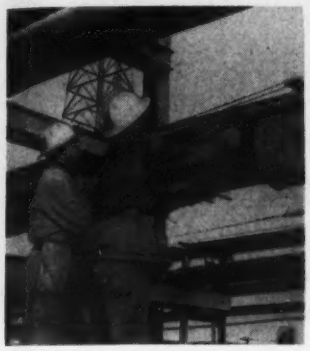
Check 2163 opposite last page

with a metal fabric of 16-gage wires welded in a 2 x 2⅝" rectangular metal mesh.

Seven wires, extending from one end of the rectangular mesh, act as tie wires. Hooked under the stay wire at opposite end of mesh fabric, they hold material firmly around the pipe.

The insulation, which will



Simplicity of application is big feature of pipe insulation with built-in tie wires

withstand temperatures to 1200°F, comes in sections 2' long and 1½ to 4" thick. It is designed to insulate pipes from 4 to 30" in diameter.

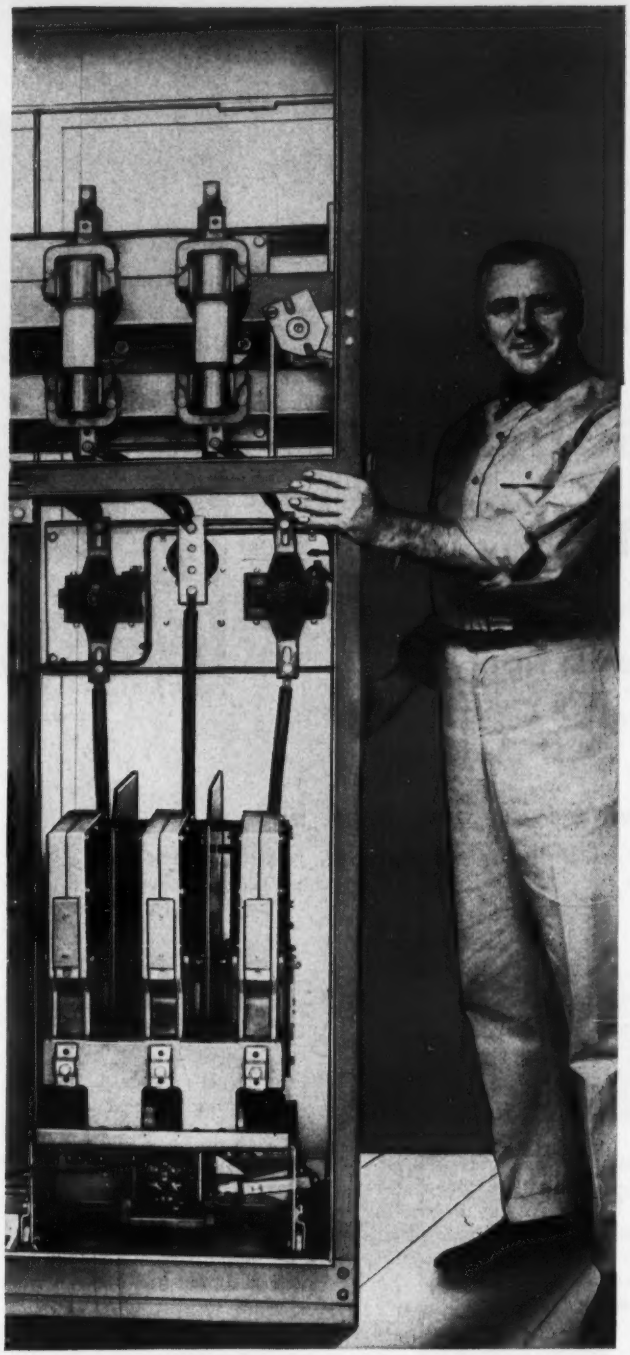
Results: Pipe insulation with built-in tie wires combines application ease of more costly, sectional-molded pipe coverings with thermal efficiency of conventional blanket-type pipe insulations. Insulation makes it possible to specify exact length of material necessary to encircle line and its two tracers. This cuts waste while avoiding tedious hand tying.

(No. 101 pipe insulation is manufactured by Baldwin-Hill Co., Trenton, N.J.)

Check 2165 opposite last page.

NEXT MONTH

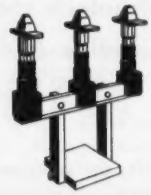
Have trouble concentrating heat sensitives? How Abbott Labs solved serious pre-production problem in process for new antibiotic is told in next month's New Solutions section.



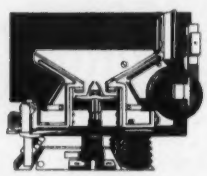
Tough high-voltage job?...Here's the answer!

Allen-Bradley High-Voltage Air Break Starters are ideal for frequent switching, reversing, plugging, or jogging.

A tremendous operating life has been built into these high-voltage air break starters . . . resulting from the use of the simple solenoid contactor. It's the same design—having only ONE moving part—that provides millions of trouble free operations in Allen-Bradley's low-voltage controls. These starters are made in a complete line for all types of service. Send for Publication 6080, today.



ONLY ONE MOVING PART
With this simple solenoid design, all trouble causing pivots, pins, and flexible jumpers are eliminated. Straight up-and-down motion of contactor is virtually frictionless.



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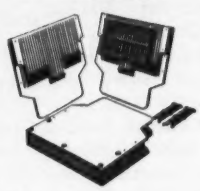
Allen-Bradley silver alloy contacts never need maintenance . . . they remain in perfect operating condition until completely worn away. Vertical motion assures uniform contact pressures at all times.



FASTER ARC SUPPRESSION
The air break contactor employs a completely different blowout design and novel arc chute which assure rapid arc extinction. Chutes are molded from arc resistant material.

A-B QUALITY

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QUALITY

MOTOR CONTROL

Allen-Bradley Co., 104 W. Greenfield Ave., Milwaukee 4, Wis. • In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

Check 2166 opposite last page

Conveyor solidifies, flakes resin

- doubles production
- prevents lumps

Photos by CP Staff

Hot, liquid resin being transferred to stainless belt conveyor

Stainless steel belt moving over water bed handles 6000-10,000 lb/hr of various resins

GORDON WEYERMULLER, Associate Editor
with **H. J. SHEARER,** Plant Superintendent
The Neville Chemical Company

Problem: Water-cooled flaking rolls used at Neville Chemical Co., Pittsburgh, Pa., limited coal-tar and petroleum resin production when demand for product was increasing. Plant was always having trouble with flakers. Algae, which would accumulate inside of units and slow down cooling, could not be easily removed. On the edge of the rolls, resin would curl back and make lumps. Hence, product was not as uniform as desired.

Plant management had to get out more production either by installing another battery of the roll flakers or by some other method.

Solution: After an investigation and inspection of a unit in another plant, Neville installed a stainless steel water-bed belt conveyor for cooling and flaking the resin. Unit was placed in service about 2½ years ago.

Conveyor consists of a moving stainless steel belt, 32" wide and 88' long. Seven pans are located beneath belt, each pan having individually controlled cooling water passing through it. Stainless belt is carried by sliding bars beneath it. Since cooling water passes over bars, the band literally floats on water.

A 5-hp motor furnishes power to move belt. Speed of belt can be varied to suit type of resin being processed. For example, if melting point of resin is low, belt must move slower to allow sufficient time for resin to solidify and flake.

In the process, liquid resin is collected in large kettles and then passes through a vertical pressure-leaf filter. (See page 44 for description of this operation.) Resin coming from filter goes to stainless belt conveyor. As resin passes down conveyor, it solidifies and breaks into large flakes.

After belt conveyor was in operation, Neville installed a rotary crusher at conveyor exit to further reduce size of flakes. Reduction of the material to ⅝" maximum size is accomplished by means of breaker knives. Unit is designed for applications where extremely fine reduction is not desired. Crusher delivers a minimum of fines.

Flaked resin leaving belt conveyor and entering rotary crusher

As resin comes down conveyor, it solidifies and breaks into large flakes

From mill, flaked resin enters Hapman disc-flight conveyor, which carries resin to packaging in either bags or drums.

Results: Stainless waterbed belt conveyor has enabled plant to double over-all production with same manpower. With increasing demand for resin products, it is possible that triple the former production may be obtained with the unit. Belt conveyor handles 6000 to 10,000 lb/hr of resin at present, depending on type being processed.

Belt conveyor and crusher system produces a higher quality product. Use of stainless steel prevents possible metal contamination from conveyor.

Maintenance costs have been decreased on flaking equipment. Former cleaning problem has been eliminated.

(Stainless belt conveyor is product of Sandvik Steel, Inc., 1702 Nevins Rd., Fair Lawn, New Jersey.)

Check 2167 opposite last page.

(Rotary crusher is product of Munson Mill Machinery, 200 Seward Ave., Utica 4, N.Y.)

Check 2168 opposite last page.

Rotary crusher reduces flakes to 5/8" maximum size

. . . a widely miscible non-aqueous solvent, azeotroping agent, Lewis-acid catalyst, intermediate, and flame-retardant additive—

METHYL BORATE

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Except for its very ready hydrolysis by atmospheric moisture, Methyl Borate, $B(OCH_3)_3$ is a quite stable compound. It does not decompose thermally below 400°C.

We'd like to discuss with you one or more of these suggested uses of Methyl Borate: as a non-aqueous solvent, as a catalyst in organic synthesis, in azeotropic distillation, as a flame-retardant additive, to prepare substituted boranes, as a catalyst for Diborane reactions, as a neutron absorber and detector, as a stabilizer for sulfur trioxide. Write for Technical Bulletin C-510.

Phone: FOrest 4-1130 TWX: 117 Perrysville, Pa.

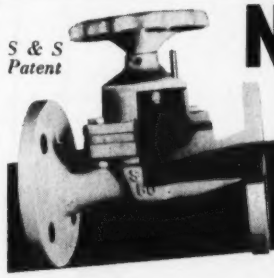
GALLERY CHEMICAL COMPANY
PITTSBURGH 37, PENNSYLVANIA

Check 2169 opposite last page

S & S Patent

NOW • new safety • longer life • greater economy

with the New Packless, Corrosion Resistant

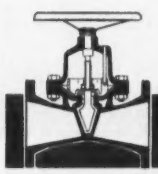


DIA-PLUG VALVES

for liquids and gases, acids, alkalis, slurries, etc.

DIA-PLUG VALVES WILL

- INSURE PERFECT CLOSURE ALWAYS
- CUT MAINTENANCE TO A MINIMUM—Dia-Plug can be changed on the line
- WORK WITH ALMOST ANY AIR OPERATOR
- OFFER EXCELLENT THROTTLING CHARACTERISTICS
- SELF DRAINING ON HORIZONTAL LINE
- TRAVEL INDICATOR FOR HAND VALVES AT NO EXTRA COST



Write for complete details and catalog

Heart of this new valve is a combination of rugged diaphragm and metal plug which insures dead tight closure even if the diaphragm is damaged. An important safety plus that may save a life, or many dollars in process.

The Dia-Plug requires less force to close—allowing for use of smaller, more economical air operators or minimum manual effort. Dia-Plug valves can withstand temperatures to 400° F. and pressures to 300 psi. Standard sizes 3/8" to 8" in cast iron or steel, stainless, bronze, aluminum, etc.

Dia-Plug Valve Corp. • 1622-A Fillmore Avenue Buffalo 11, New York

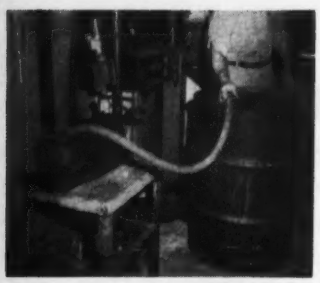
Check 2170 opposite last page

No pump maintenance in handling 30% HCl for nine months

All moving and metallic parts are in Hypalon liner

A small rotary pump provided nine months of maintenance-free service in the handling of acid at the Nutley, N.J., pharmaceuticals plant of Hoffmann-LaRoche, Inc. During this period 30% HCl was pumped daily from drums to measuring tank. All previous pumps had failed at the packing gland, or couldn't be satisfactorily primed.

The reason for the pump's success was its design em-



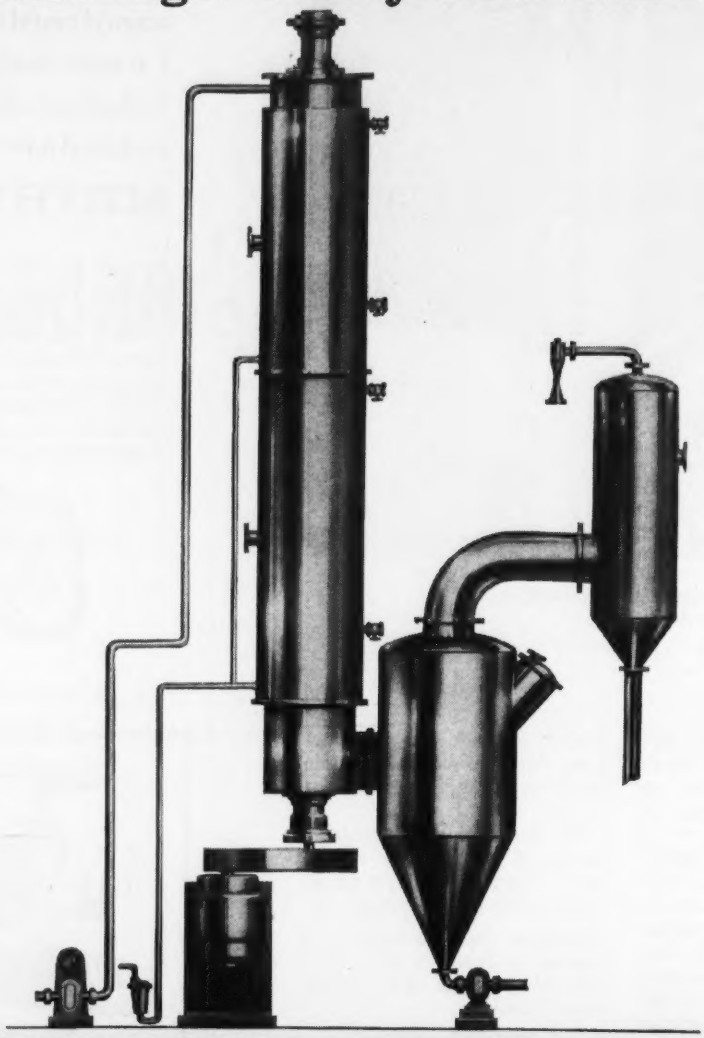
Because all moving and metallic parts are contained within a flexible Hypalon liner, rotary pump provides maintenance-free service in handling of 30% HCl

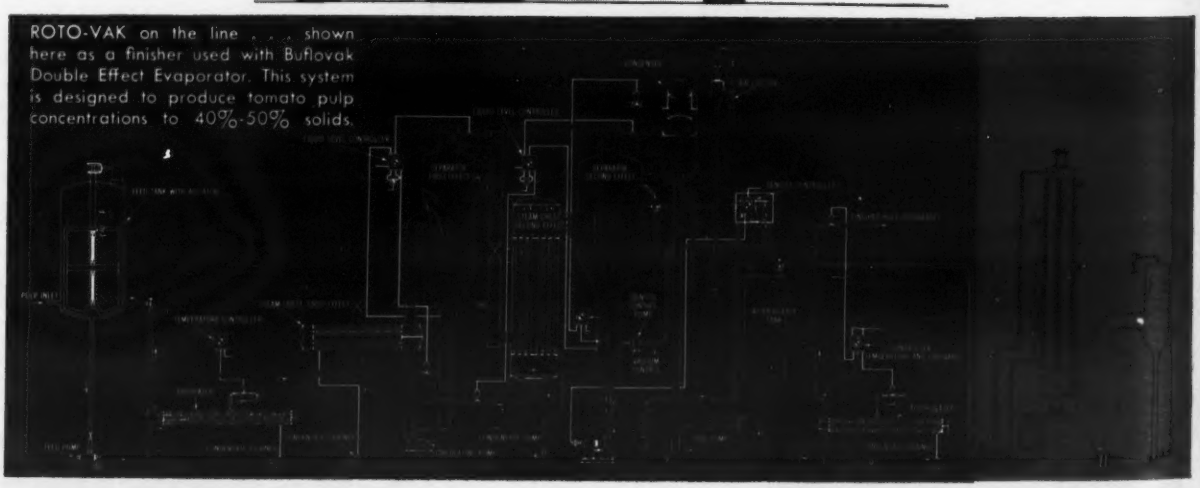
bodying all moving and metallic parts within a flexible Hypalon liner. The tubular liner itself is flanged and clamped to the exterior of the molded plastic pump body by end plates. All fluid pumped is trapped between the outside surface of the flexible liner and the interior of the pump housing. Acid is continuously rolled from inlet to discharge by an eccentric, inside the liner, connected through the end plate to the motor shaft. Stuffing boxes, shaft seals, gaskets, and check valves are eliminated.

Although the initial installation was no longer required because an equipment change eliminated need for it, the flexible liner pump had thoroughly proved its worth to Hoffmann-LaRoche engineers. Several additional units were planned for service at other locations, pumping corrosive

New Buflovak

. . . provides high density heat transfer . . . helps





ROTO-VAK on the line . . . shown here as a finisher used with Buflovak Double Effect Evaporator. This system is designed to produce tomato pulp concentrations to 40%-50% solids.

Agitated Film ROTO-VAK

upgrade product quality . . . cuts production costs

Whatever your product—viscous, foamy or extremely heat-sensitive—the new Buflovak Agitated Film ROTO-VAK will produce a high quality product . . . and build your processing profits.

A product of Buflovak's extensive background in evaporation, this ROTO-VAK permits *high density* concentration of a whole range of new materials. Turbulent, thin film action provides superior heat transfer rates with shortened controlled contact time.

Temperatures formerly regarded as critical for many heat-sensitive products are now practical. For more details of this new advance in profitable processing, write for the new ROTO-VAK Bulletin No. 383.

Handles any fluid material. Any material which can be pumped can be processed effectively in Buflovak's new ROTO-VAK.

External Vapor Separator provides high efficiency, centrifugal separation. Vapor and product are separated independently from the heating surface. True down-flow design eliminates reflux of product.

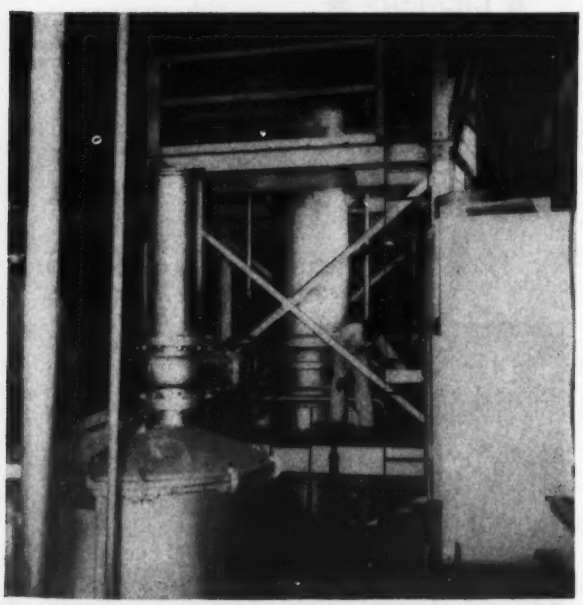
Main Drive at floor level affords easy access for maintenance. Located off the center of the rotor, the entire rotor assembly is easily removed when required.

External Bearings use well designed mechanical seals or stuffing boxes to eliminate product contamination. Only the rotor assembly contacts the product.

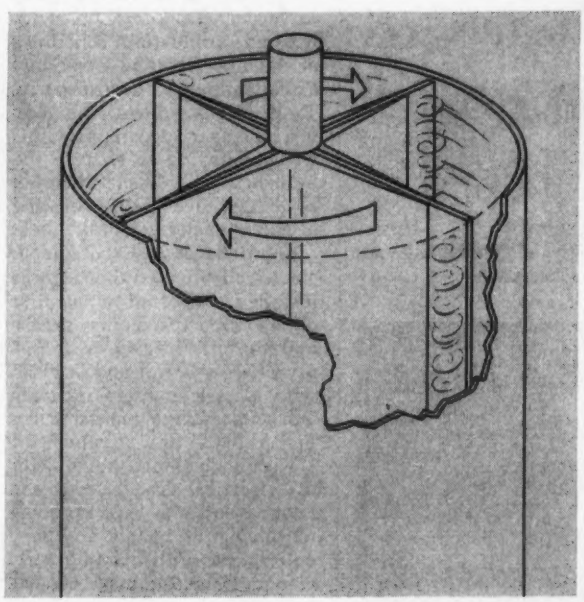
BLAW-KNOX

BLAW-KNOX COMPANY
Buflovak Equipment Division
1645 Fillmore Avenue, Buffalo 11, New York

ROTO-VAK produces tomato paste at 40% to 50% solids. The concentrated product retains its original qualities, is immediately ready for canning. An additional sterilization process is eliminated.



The spinning rotor agitates the down-flowing, thin-film of liquid into a violent turbulent action. Burn-on, and encrustation due to over-heating are eliminated.



Check 2171 opposite last page

chemicals without posing the problem of leaking stuffing boxes.

(Hypalon synthetic rubber is product of Elastomer Chemicals Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.)

Check 2172 opposite last page.

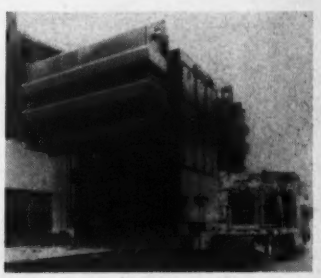
(Rotary pump is product of Vanton Pump & Equipment Corporation, Div. of Cooper Alloy Corporation, 201 Sweetland Ave., Hillside, N.J.)

Check 2173 opposite last page.

Transformer combination beats deterioration, saves space

Cuts exposed surface 90%, reduces weight by 35%

Problem: Transformer formerly in use at Dow Chemical for chlorine production was a bulky, air-cooled unit. In designing a transformer to take its place, engineers desired water cooling, which would be more efficient. Since only salt water was available for cooling, new unit had to be able to withstand this corrosive. In addition, exterior had to resist the hot, corrosive salt air of the Gulf Coast.



Transformers combined in a single tank reduce surface area exposed to corrosive atmosphere

Solution: Rectifier transformer and regulating transformer were combined in a single tank. The complete unit was arranged for direct seawater cooling, using a copper-nickel cooling coil.

The rectifier transformer converts 3-phase AC power coming in from utility lines to 12-phase AC power that is fed to the cell lines. It is called a

NOV 58

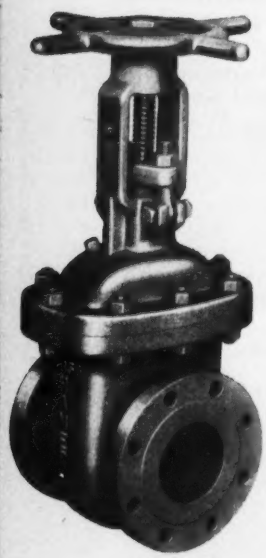
New Hamer "Wedge Seal"

LEAKPROOF GATE VALVE

"Dual" Leakproof Sealing Action

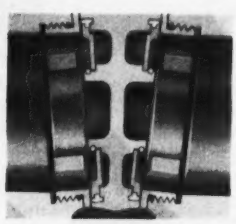
Positive Shutoff Upstream — Downstream

Serviceable in the Line



The new Hamer *Wedge-Seal*, unlike conventional Gates, incorporates a two-way sealing action that insures absolute line shut-off even on lines handling customarily hard-to-hold fluids. As the wedge is lowered to its precision metal-to-metal fit, a Teflon* seal in each side of the wedge compresses against the seats, forming a dual bubble-tight sealing action. Yet, with all of its added sealing quality, the new *Wedge-Seal* costs little more than a regular gate. Send for free literature today. See for yourself how a Hamer *Wedge-Seal* can actually pay for itself.

*RTM DuPont



Renowned for their inert characteristics, Teflon seal rings used in the new *Wedge-Seal* have amazing durability, can be replaced, when necessary with minimum effort.

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Box 1851, Long Beach 1, Calif.
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58-3A

Check 2174 opposite last page

rectifier transformer because the 12-phases then feed to rectifiers that convert the AC to DC for use on cell lines.

The regulating transformer is merely used to maintain proper voltage at all times. Combined unit is rated at 13,688 kva when cooled with sea water. Alloy used for the cooling coil is 30% copper and 70% nickel.

A three-coat finish especially designed to resist corrosive atmospheres was applied to the unit.

Results: By using the combination transformer unit a savings in floor space of 70% was effected. The cooling surface exposed to atmosphere was reduced by 90%, and weight reduction was 35%.

(Transformer unit is product of Westinghouse Electric Corporation, PO Box 2099, Pittsburgh 30, Pa.)

Check 2175 opposite last page.

Grease output boosted with minimum expense at Atlantic Refining

Electrically-heated kettle keeps costs down

Problem: Grease production facilities had to be expanded in order to keep up with boosted production schedules at Atlantic Refining Company, Philadelphia, Pennsylvania. To keep costs down, company wanted to accomplish this without having to enlarge the existing Dowtherm heating system, which was operating at full capacity.

Solution: A self-contained, electrically-heated kettle was installed. Reported to be first of its kind used for grease making, unit has its own supply of Dowtherm, and is fitted with electric immersion heaters. Operating temperatures up to 700°F are possible.

Kettle combines advantages of electrical and Dowtherm heating without disadvantage of having to install auxiliary equipment. Full heating efficiency is maintained, regardless of rate of heat input needed by process, and there are no boiler, pipes, or valves

You can't pour it...

*

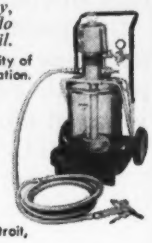
but you can PUMP it!

Are heavy materials a problem in your plant? Graco Powerflo Pumps may provide the answer. These pumps mount on pails or drums... easily spray or extrude thick compounds quickly, get all the material from original container.

Rugged Graco Powerflo Pumps eliminate messy dispensing by paddle or scoop. Air powered, they speed up production...cut waste... save labor...help improve plant "housekeeping". Write today for the Powerflo catalog.

* *Unretouched photo shows five gallon pail of heavy, nearly solid sealing material. A Graco Powerflo Pump successfully pumped it out of original pail.*

WRITE FOR DETAILS on Graco Lab test to check pumpability of your materials. Graco lab report furnished without obligation.



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Check 2176 opposite last page

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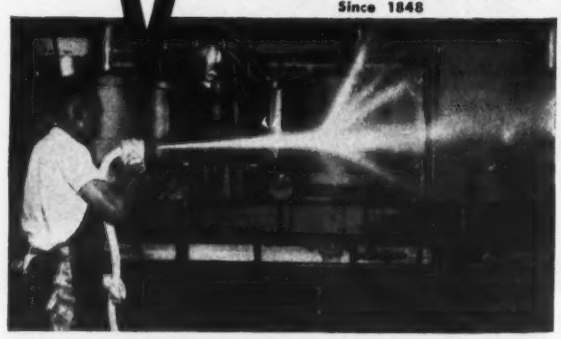
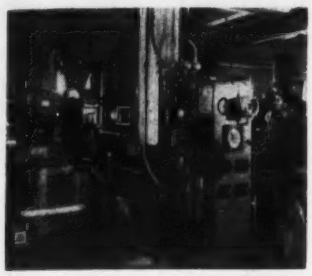


Check 2177 opposite last page

to worry about. Similar kettles have operated in other applications continuously for over 5 years at a time without any maintenance.

Results: Use of the kettle has raised grease producing capacity of plant to the desired level. Tests have shown that kettle's heating efficiency is considerably higher — approaching practically 100 percent as compared to 75-80 percent of an oil or gas-fired boiler.



Electrically-heated kettle (left) has self-contained supply of Dowtherm, doesn't require boiler, pipes or other auxiliary equipment

(Electro-Vapor kettles are manufactured by the Buflovak Equipment Division, Blaw-Knox Company, Buffalo, New York.)

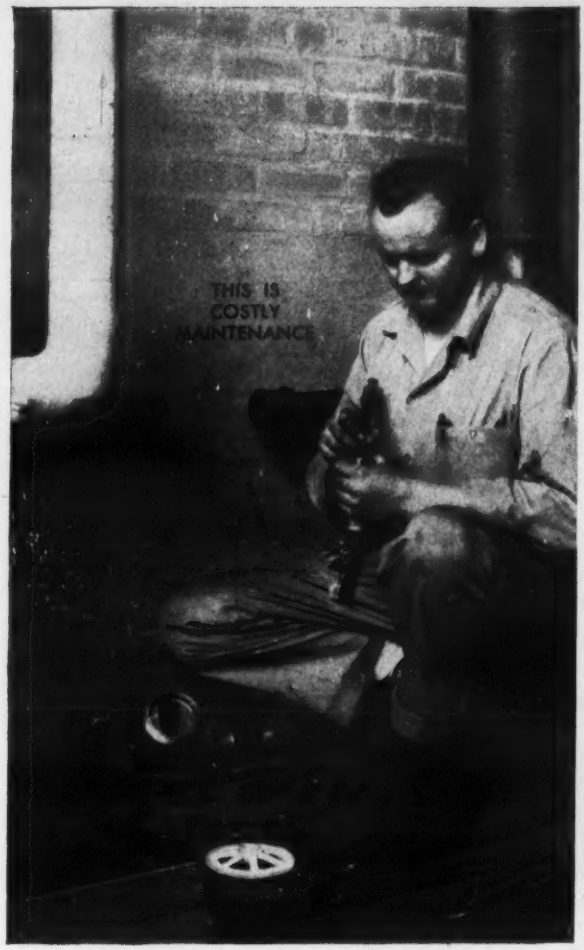
Check 2178 opposite last page.

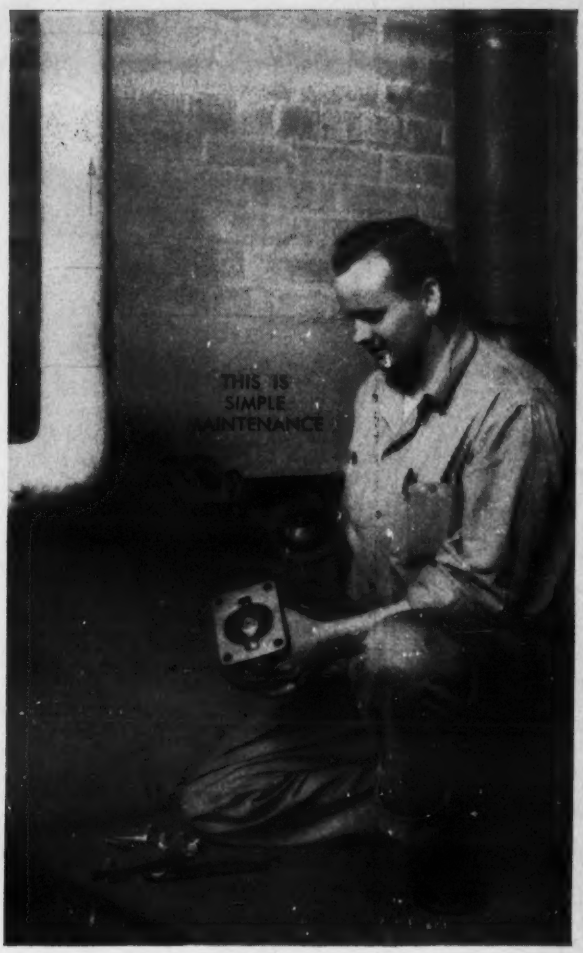
Phosphoric acid tank . . .

. . . at fertilizer plant of Woodbury Chemical Company, St. Joseph, Mo., is rubber-lined. Holding 8000 gallons of phosphoric acid, the tank has given trouble-free service in handling this highly corrosive material since placed in service in 1955.

(Rubber-lined tank is product of Gates Rubber Company, Inc., 999 South Broadway, Denver 17, Colo.)

Check 2179 opposite last page.





You NEVER have to remove a Hills-McCanna valve body!

When Hills-McCanna Diaphragm Valves are installed in a line they are as permanent as an elbow. The valve body is never removed from the line even for maintenance. Unions are not required. Ordinary tools are used to take the bonnet off and expose the diaphragm for quick replacement—a simple procedure that virtually provides a new valve for another period of long service!

Packless design of Hills-McCanna Diaphragm Valves assures good housekeeping, eliminates dripping, cleaning. There's no leakage, no seats to grind. But simplified maintenance is only part of the Hills-McCanna story—get all the facts on positive flow control, valve bodies to match construction materials of any pipe or pipe lining. Write for new booklet offer below.

NEW BOOKLET GIVES INSIDE STORY ON VALVE SELECTION . . .

This helpful guide discusses primary considerations in selecting valves, shows engineering principles and benefits of the Hills-McCanna Diaphragm Valve and applications. Write for your free copy today—"Diaphragm Valves for Every Type of Pipe."

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hills-mccanna company
THE PEOPLE WHO KNOW AND CONTROL FLOW

Check 2180 opposite last page

These two styles of Allpax Packing cover a wide range of applications and many different uses, consistent with the policy of our company—fewer packings for more services.

Both are compounded of the highest quality materials, and between them they cover against such service conditions as steam, water, air, ammonia, gases, oils, distillates, dowtherm, etc. They are for use on centrifugal and rotary pumps, valve stems, expansion joints and similar equipment.

Packaged in durable metal containers to insure protection and preservation of material. Applications and uses conveniently noted on each container.

Style No. 1 is really universal in its uses—where the temperature does not exceed 600 degrees F.

Style No. 2 also has an extremely wide variety of uses in higher temperatures, ranging from 600 degrees F. to 1200 degrees F. This is because of a special bonding compound, containing a heat-proof lubricant, which maintains the lubricant under high temperature conditions.

Both types are made in ring, spool or coil form in a wide variety of sizes. Allpax Packings do a better job for manufacturers and replacement use because they are precision-made, accurate in dimensions. They provide a tight seal without danger of scoring or unnecessary wear.

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Check 2181 opposite last page

Shock from 50 tons of catalyst per min absorbed by units

Have given four years of trouble-free service

Problem: Catalyst transfer system at the Watson, California, refinery of Richfield Oil Corporation would have been subject to quite violent bumping unless proper preventative measures were taken.

In the fluid catalytic cracking unit at the refinery 50 tons of catalyst per min at about 1000°F is transferred from one vessel to another by use of air and gases. Material first flows through a 122″-diameter line and then is distributed equally between two 60″ lines.

Catalyst-air circulating duct on fluid catalytic cracking unit. Arrows indicate location of rotary shock absorbers

Solution: As part of the original design, six rotary shock absorbers were installed on the 122″ regenerator riser line and four on each of the two 60″ reactor riser lines.

Although each system of lines is completely welded without expansion joints, the shock absorbers allow freedom of movement of lines. Inertia of pulsation is absorbed in both a longitudinal and lateral direction. Absorbers also permit contraction and expansion.

Shock absorber consists of an outer reservoir which houses four working chambers and a reserve chamber. Of four working chambers, two are stationary and two are fixed to a movable, central wingshaft. Wingshaft is attached to line containing catalyst. As wingshaft is moved in either direction, hydraulic fluid is forced through valve and into other two chambers, dampening shock.

Results: Design has proved itself at Richfield with four years of trouble-free service. Similar systems installed in several other refineries have controlled vibration successfully. Such a system could be applied to dampen pulsation in other operations where large volumes of fluids are handled in lines.

(Rotary shock absorbers are product of Houdaille Industries, Inc., Buffalo Hydraulics Div., 537 E. Delavan Ave., Buffalo 11, N. Y.)

Check 2182 opposite last page.

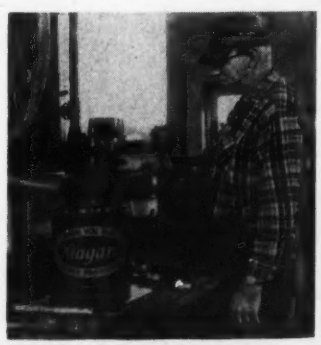
(Fluid catalytic cracking unit and catalyst handling system were designed and built by C. F. Braun & Co., Alhambra, California.)

Check 2183 opposite last page.

Container corrosion beat by phenolic lining that resists acids

Creates lasting barrier between product, steel

Problem: Leakage and contamination of products due to corrosion in steel shipping containers plagued packaging operations at the Middleport, N. Y., plant of Niagara Chemical Division, Food Machinery & Chemical Corporation. A leading manufacturer of liquid insecticides, fungicides, and



Adoption of containers with pigmented phenolic linings stopped leakage and contamination of products in handling of liquid insecticides, fungicides, and herbicides

herbicides, Niagara's chemical shipments consist principally of chlorinated materials in an organic solvent with an emulsifying agent.

The most frequently used containers for these products are 55-gal and 30-gal tight-head drums, and double-bead, tight-head 5-gal pails.

Solution: Niagara adopted containers with pigmented phenolic linings. Liner completely covers metal surfaces and joints with a uniform, tight, and flawless coating.

Tests of these linings were conducted by Niagara engineers. Sample strips were exposed to the product in the laboratory, and filled containers were carried on a highway truck for months, subjected to vibrations and shocks that are normal in transporting the products.

Results: Corrosion of the steel drums and pails used as shipping containers stopped. No more leakage or contamination of products occurred. Tests of linings proved conclusively that a barrier was created between the product and the steel, separating them effectively far beyond the required time.

(Pigmented phenolic linings were applied to shipping containers by Jones and Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.)

Check 2184 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Pipe flexibility problems and their solutions are discussed in eight-page bulletin illustrating applications of swing joints and flexible ball and strut joints. Photos and diagrams illustrate solutions to many problems regarding handling of thermal expansion in permanent pipe installations, and handling of hot asphalt or tank car and truck loading lines. Bul 28A — Barco Mfg. Company, Dept. J4, 500 North Hough St., Barrington, Illinois.

Check 2185 opposite last page.

A Bronze yoke bushing nut
B Handy grip iron wheel
C Bronze yoke bushing
D Iron yoke cap with zerk fitting for lubricating bushing
E Steel yoke cap bolts and nuts
F TYPE 316 STAINLESS STEEL spindle
G NI-RESIST CAST IRON, TYPE 2, yoke
H Bronze eye bolt nuts
I Malleable iron gland flange
J Steel gland eye bolts
K Steel gland lug bolts and nuts
L TYPE 316 STAINLESS STEEL gland
M Teflon impregnated asbestos packing
N TYPE 316 STAINLESS STEEL bonnet bushing
O NI-RESIST CAST IRON, TYPE 2, bonnet
P Steel bonnet bolts and nuts
Q TYPE 316 STAINLESS STEEL spindle ring
R Asbestos gasket
S TYPE 316 STAINLESS STEEL wedge pin
T NI-RESIST CAST IRON, TYPE 2, through-port body
U TYPE 316 STAINLESS STEEL solid I-beam wedge
V TYPE 316 STAINLESS STEEL seat rings

Wherever valves are attacked by acids, salt and alkaline solutions, sea water, brine or other corrosive fluids, vapors or gases, "Jenkins Ni-Resist Gate Valves" are *fighting* words.

In a wide range of corrosive and erosive services common to the chemical, food, plastics, marine, petroleum, and pulp and paper industries, these valves have shown a remarkable ability to withstand corrosion and cut valve costs.

The secret of their long, trouble-free service is the combination of Ni-Resist type 2 cast iron and type 316 stainless steel trim, plus Jenkins *extra value* construction throughout. No other gate valves offer this combination for fighting corrosion.

When choosing Ni-Resist valves, let the famous Jenkins Diamond be your guide. Specify "JENKINS NI-RESIST" — for longer valve life. Write us, or ask your Jenkins Distributor for information folder No. 205. Jenkins Bros., 100 Park Avenue, New York 17.

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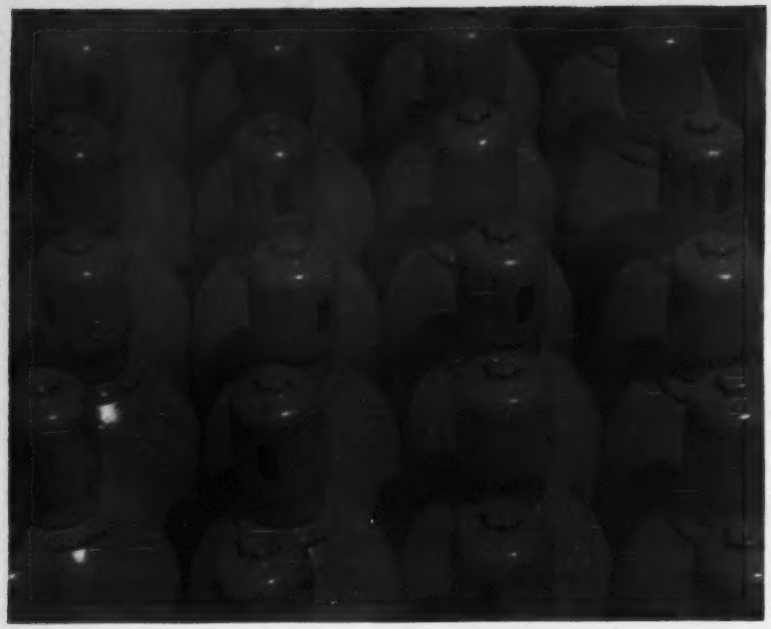

Save money on every compressed gas shipment with lightweight Hackney cylinders

Lightweight—selected high-quality steel formed by the Hackney deep, cold drawn process produces lightweight cylinders that save on shipping and handling costs.

Rugged construction—there's no sacrifice of safety or durability. Hackney cylinders exceed minimum ICC specifications.

Uniform sidewall thicknesses—from top to bottom, from side to side. Cold drawing eliminates excess material that could add nothing but excess weight.

Uniform weight and capacity—simplify filling, handling and record-keeping.

Smooth surfaces—are easily cleaned and painted. Cylinders can be kept attractive at minimum maintenance cost.

Since 1902—Pressed Steel Tank Company has been manufacturing high-quality containers for gases, liquids and solids. In cooperation with industry leaders, regulatory bodies and materials suppliers, Pressed Steel Tank Company has pioneered in developing lightweight cylinders which have been adopted as standard for shipping many kinds of compressed gases. Wide range of types and sizes. Write for details.

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CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

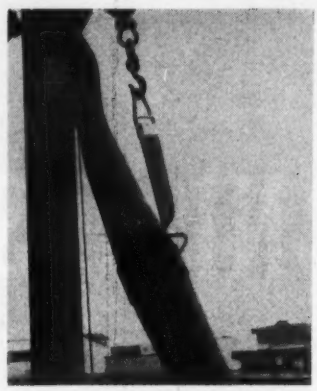
Check 2187 opposite last page

NEW SOLUTIONS

Unloads oil tankers faster, cuts hose replacements

Woven-wire slings hold hose, permit maximum flow rate

Problem: Conventional slings used to support slack in hose while unloading liquid petroleum products from tankers at east coast refinery produced kinks in the hose. Kinks restricted the flow of petroleum. Also, when hose was not in use, slings had tendency to permanently seat themselves between spirals in core of hose. Hose movement in wind eventually caused slings to wear through, necessitating costly replacement.



Woven-wire sling keeps hose in proper position without inflicting damage and permits faster unloading of tankers

In performing the unloading operation, it is necessary to use some type of sling to provide slack in hose to compensate for tidal and wave action. This prevents hose from snapping when tanker drops with tide.

Solution: Woven-wire slings were purchased to replace the conventional slings. Wire slings have broad bearing surface distributing weight of hose over wide area. Transverse looped construction of sling permits it to flex across its width, and enables it to wrap completely around hose in firm, non-slip, but gentle grip.

Results: Since changing to woven-wire slings, company has been able to unload its tankers at much faster rate. Hose replacements have been

PUMP PROBLEMS

write

TABER

BEFORE DECIDING ON TYPE OF PUMPS . .

SEE TABER BULLETINS

May avoid costly pump misapplication.

Vertical pump illustrated, for handling chemicals, please request Bulletin V-837. Horizontal Pump, Bulletin C-355.

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Check 2188 opposite last page

practically eliminated. Broad bearing surface of the slings prevents any kinks in hose and permits liquid to flow through hose at maximum rate. No matter how much hose moves around, there is no cutting or sawing action to cause damage and necessitate replacement.

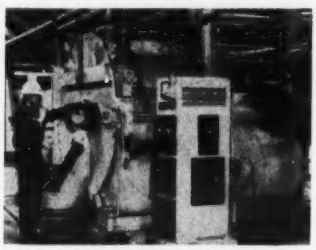
(Woven-wire sling is product of Cambridge Wire Cloth Co., Cambridge, Md.)

Check 2189 opposite last page.

Cloth life up 25 times on titanium plant's centrifuge

Use of synthetic filter fabric boosts process efficiency

Problem: Short service life was being obtained from conventional filter cloth being used on centrifuge drying titanium sponge at the Ashtabula, Ohio, plant of Electro Metallurgical Company, Division of Union Carbide Corporation.



Centrifuge rotates at speeds up to 500 rpm, washes and dries titanium sponge

Cloths lasted about 24 20-minute cycles. They had to be changed daily — a job taking 1½ hours. Cloths measure 26" wide by 18" long and fit against circular wire wall of centrifuge.

When first placed in centrifuge the titanium sponge is heavily laden with harsh acids. It is washed thoroughly several times before being spun dry. Centrifuge rotates at speeds up to 500 rpm.

Solution: The conventional cloth was replaced by woven cloth made of Dynel, an acrylic fiber produced by Union Carbide. Material's high wet strength and resistance to chemicals give it extended service life. Cloth keeps its strength and shape even after repeated wetting and drying.

Product retains its open weave and permits free escape of moisture at all times. This prevents shutdowns due to plugging or blinding of the fabric.

Results: Cloths now last 600 cycles, compared to 24 cycles for previously used material. Cloths are changed every 25 days instead of every day — resulting in labor savings of about 36 hours per month.

Fabric's constant drainage rate has also permitted modifications in feed to the centrifuge, resulting in additional production efficiency. Approximate cost of each cloth is $18.00.

(D-2003 Dynel filter cloth is woven by National Filter Media Corporation, 1717 Dixwell Avenue, New Haven, Connecticut.)

Check 2190 opposite last page.

(Further information about Dynel fiber may be obtained from Textile Fibers Department, Union Carbide Chemicals Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, New York.)

Check 2191 opposite last page.

"My men are getting 'wall-eyed'! Either stay out of this department, Miss Glampuss, or buy another dress!"

. . . a mildly alkaline solid; intermediate, catalyst, corrosion inhibitor—

SODIUM METHYL CARBONATE

2

Sodium Methyl Carbonate, $CH_3OCOONa$, is practically insoluble in many organic liquids, but is remarkably soluble in ethylene glycol and in glycerine. A relatively unknown and unexplored compound, it has an unusual combination of organic and inorganic properties.

Applications research on Sodium Methyl Carbonate continues at our laboratories. Some present and potential uses are: as an intermediate for preparing salicylates, ethylene carbonate, and benzyl carbonates; to neutralize weak acids; as a carbon dioxide source; to catalyze the alcoholysis of polyvinyl esters and glycerides; and to inhibit corrosion of anti-freeze cans. Write for Technical Bulletin C-910.

Phone: FOrest 4-1130 TWX: 117 Perrysville, Pa.

GALLERY CHEMICAL COMPANY
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Check 2192 opposite last page

Binks spray nozzles

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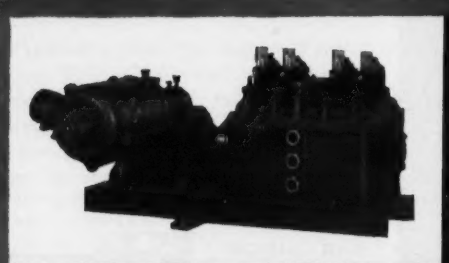
MANZEL

Manzel is the accepted source for lubricator requirements up to 30,000 psi. Your operations may not call for these pressures, but Manzel offers you the same outstanding dependability in its regular line of force feed lubricators. Experienced Manzel field engineers will work with you to solve any lubrication problem.

WRITE FOR COMPLETE CATALOG giving specifications and performance requirements to meet any of your lubricator needs.



Manzel

274 Babcock Street · Buffalo 10, New York

Specialists in lubricators and metering pumps since 1898

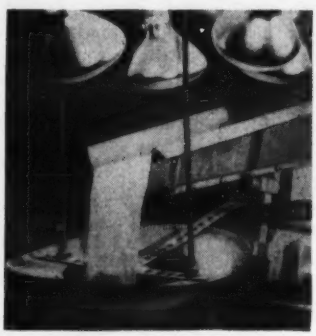
Check 2194 opposite last page

NEW SOLUTIONS

Baking and shaking stops caking of abrasives

Combination of infra-red heat lamps and vibratory feeder used at American Graded Sand Co., Chicago, assists in maintaining rigid quality control standards in their processing of abrasive materials.

As feeder supplies constant, uniform flow of sand from storage bins to screening machinery, battery of infra-red lamps installed about it remove minute micron surface moisture, thus reducing surface area of the sand particles and minimizing binding in the screens.



Heat lamps above vibratory feeder remove moisture from product, prevent caking

Vibratory feeder has electro-permanent magnetic drive that requires no rectifier, and needs only to be plugged in to any available AC line. Vibrating action of tray produces accurate flow of material, completely controllable within range of ounces to tons per hour.

(HI-VI vibratory feeder is product of Eriez Manufacturing Co., 1945 Grove Dr., Erie, Pennsylvania.)

Check 2195 opposite last page.

Palletless handling in manufacturing plant is described in illustrated four-page bulletin which tells how plant was able to meet fluctuating production schedule through conversion to fleet of electric industrial trucks. Case History Bul 362-1 — Lewis-Shepard Products, Inc., Dept. R8-15, 125 Walnut St., Watertown 72, Mass.

Check 2196 opposite last page.

HIGH EFFICIENCY

DUCLONES®

assure maximum recovery at lowest cost

DUCLONES—Ducon high efficiency cyclones—are designed and constructed for high recovery efficiency and low gas resistance. Their sturdy construction assures long, continuous service with a minimum of maintenance.

The exceptional performance of Duclone collectors is the result of these 6 unique features:

1. Small Diameter produces high efficiency
2. Helical Roof provides a turbulence-free path for the entering gas stream
3. Steep Cone improves dust separation
4. Dust Trap assures efficient dust removal from the cone
5. Vortex Shield prevents re-entrainment of dust in upward gas vortex
6. Scroll Outlet provides a low resistance clean gas outlet

send for Bulletin C-958.

DUCON DUST CONTROL SYSTEMS AND EQUIPMENT

the name in DUst CONtrol

THE Ducon COMPANY, Inc.

147 EAST SECOND STREET · MINEOLA, L. I., NEW YORK

Check 2197 opposite last page

THAT'S INTERESTING

De-salting

Solvent de-salting process for converting sea water to fresh water looks especially promising because of low cost. Researched at Texas A & M, process brings together solvent and sea water at room temp; water dissolves, leaving brine undissolved. After heating water-solvent mixture for separation, solvent can be re-used. (*Industrial Research Newsletter,* Armour Research Foundation)

Rock 'n' roll cuts mileage

As a sidelight to study of motor fuels and lubricants at Esso Research Center it was learned that rock 'n' roll music on a car radio can cause a driver to jiggle the accelerator pedal in rythm with the music. Unnecessary working of pedal can cause significant decrease in gas mileage.

For more information on product at right, specify 2198 see information request blank opposite last page.

5,000 Homestead Valves chosen by A. B. Dick Co.

Homestead's leak-proof and stickproof qualities . . . plus their fast and positive action, result in trouble-free operation in a wide range of industrial applications.

For example, the more than 5,000 lubricated and non-lubricated Homestead Plug Valves in the A. B. Dick Company's Chicago plant control many difficult-to-handle services . . . such as aqueous and lacquer-type coatings, gas, duplicating inks and condensates. Write today to discover how Homestead Valves can reduce *your* operating costs.

Please send me additional information on Homestead Valves. We are interested in this specific application_____

_____

NAME_____

STREET_____

CITY_____ ZONE____ STATE_____

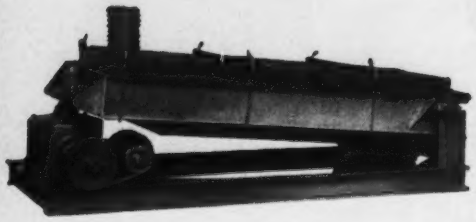
hv

HOMESTEAD VALVE MANUFACTURING COMPANY

P. O. Box 140, Coraopolis, Pennsylvania

ROTEX®

SCREENERS GIVE



PROFITABLE PRODUCTION!

ROTEX FEATURES

- Low head room
- No screen blinding
- Fast screen changes
- Dependable service
- Dust-tite construction
- Rugged construction

For over 40 years ROTEX Screeners have been widely used throughout industry. Today there are installations in the United States and over 25 foreign countries. Built for dependable service, ROTEX are long known for accuracy, capacity and operating economy.

ROTEX SCREENING ACTION:

The nearly level, gyratory motion, pioneered in ROTEX, conveys materials rapidly over screen surfaces with minimum vertical vibration or hop. This stratifies the material by particle size, rapidly passing undersize particles through the mesh openings. The results are clean separations of exacting accuracy coupled with high capacity. Designed for operating convenience, ROTEX Screeners pay for themselves by the economies they effect.

ROTEX WIDE SELECTION:

To meet your requirements: 25 standard models—one to five screen surfaces—many semi-standard and special models—sanitary and all-metal construction available.

Write for Bulletin 401 and information on your screening requirements. Our engineering staff will be pleased to cooperate with you.

MECHANICAL FEATURES

All Metal Screen Box
Self-Aligning Slide Bearings
Quiet Running Counter-Balanced Drive
Heavy Welded Structural Steel Base

ROTEX | The Orville Simpson Co.
1246 Knowlton St., Cincinnati 23, Ohio

Check 2199 opposite last page

NEW SOLUTIONS

Fail-safe features save time, money in batching

Malfunction halts production, warns personnel at once

Problem: An error at any time during weighing or proportioning cycles in the manufacture of asbestos-cement pipe would result in an expensive waste of time and materials if not spotted and corrected immediately. Consequently, Keasbey & Mattison Co., sought to incorporate fail-safe features into the design of a new plant near Santa Clara, California.

To insure that pipe will stand pressures up to 800 lb per sq in and have long-life properties, silica, portland cement, and hard-to-handle long-fiber asbestos ingredients must be weighed and proportioned positively and accurately. Following rigid specifications had to be met: 1) automatic weighing and proportioning of materials on predetermined time sequence; 2) automatically printed record of each weighing; 3 extra provisions for occasional manual operation.

Two other problems had to be solved. The asbestos fiber tends to arch up in hopper and requires special care to assure proper streaming-out

To page 62

WANTED: NOMOGRAPHS — WORTH $20 EACH!

Do you have a pet nomograph that could save time for other CHEMICAL PROCESSING readers? If so, send it neatly and accurately drawn, with a double spaced, typewritten description to:

Data Editor
CHEMICAL PROCESSING
111 E. Delaware Place
Chicago 11, Illinois

We will pay $20 for each one accepted and published.

DEPENDABLE SKIN PROTECTION

AGAINST:
ACIDS
ALKALIS
RESINS
GLASS FIBERS
CHEMICALS
METALS
ORGANIC IRRITANTS
FUMES

with
"KERODEX"® BARRIER CREAM
"THE MIRACLE SECOND SKIN OF INDUSTRY"

REDUCES CLAIMS, INJURIES, LOST TIME... INCREASES PRODUCTION IN MANY PLANTS

"Kerodex" Barrier Cream fits the skin like an invisible glove...is as strong and elastic as the skin itself. Protects workers from skin injuries and job hazards. "Kerodex" is nongreasy, nonsmeary. Does not affect materials handled. Now being repeatedly used by thousands of industrial plants to reduce injuries and claims.

"KERODEX" 71
protects against water and water-soluble irritants.

ACIDS
ALKALIS
CUTTING OILS
PLATING SOLUTIONS
EPOXY RESINS
AMINE HARDENERS
CHROMATE SALT
ETC.

"KERODEX" 51
protects against water-insoluble irritants.

DYES
SPIRIT
GLUES
PAINT
GLASS FIBER
RUBBER SOLUTIONS
POISON IVY
ETC.

NOW TEST "KERODEX" IN YOUR PLANT WITH THIS INTRODUCTORY OFFER
12—4 oz. tubes "Kerodex" (approximately 60 applications per tube) type 51 or type 71
ONLY $10.80 post paid ($18.00 list value)

Ayerst

"KERODEX"® is manufactured by AYERST LABORATORIES 22 East 40th Street, New York 16

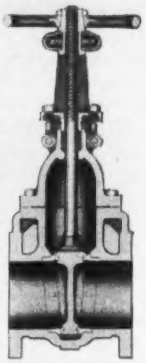
AYERST LABORATORIES
22 East 40th Street, New York 16, N.Y.

Please ship
.... dozen tubes, "Kerodex" 71 .... dozen tubes, "Kerodex" 51
TO: Name of Company
Address
City State
Attention of: Name Title
Money order or check enclosed in the amount of $
☐ Please bill us 5882

Check 2200 opposite last page

PROCESS PIPING POINTERS

Higher nickel content makes cast iron valves more useful

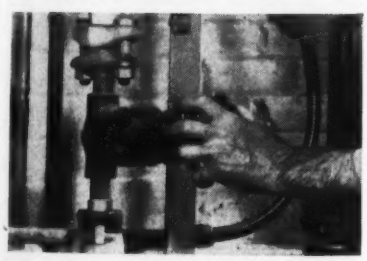


Three per cent nickel alloy iron wedge gates and a companion line of swing-check valves are now being supplied regularly in sizes 2 to 18 in. Corrosion-resistance is substantially improved by the added nickel content, and usefulness of these valves for process piping is extended. Price is only slightly higher than ordinary cast iron valves — an attractive value for process plants. See below for literature. Please mention 3% nickel iron valves.

Plastic piping usage grows on process fluids

Now pressure-temperature rated in sizes ½ to 2 in. incl., flexible polyethylene pipe of virgin material is getting wider application for both corrosive and non-corrosive fluids handling. Durable, leak-proof joints —plastic-to-plastic or plastic-to-metal pipe and valves — are assured with modified polystyrene insert fittings. Installation is fast, low-cost; one man can handle with simple hand tools. Ask for Circular AD-2205 — See below.

Found — a chlorine valve that lasts and lasts!



A Midwest paper mill reports 10-year trouble-free, maintenance-free service from valves on tough chlorine gas throttling service—with the valves still in tiptop condition. Read full details in Crane ad on next page.

For literature or data on product listed above, please contact J. E. Bradbury, Manager, Chemical Sales Dept. No obligation

CRANE CO.

Gen'l Offices: 836 S. Michigan Ave., Chicago 5

VALVES • FITTINGS • PIPE

PLUMBING • HEATING • AIR CONDITIONING

Branches and Wholesalers Everywhere

Check 2201 opposite last page

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J. R. SCHLEY
Chief Corrosion Engineer
Haynes Stellite Co.
Div. of Union Carbide Corp.

CORROSION KEYS

HASTELLOY® ALLOYS

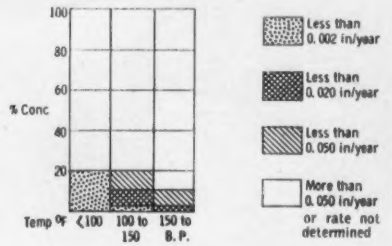
Corrosion keys presented here are a supplement to data appearing in July CHEMICAL PROCESSING, page 125, covering Hastelloy Alloys B, C, D, and F in acetic, formic, hydrochloric, nitric, phosphoric, and sulfuric acids. Here is additional information on performance of these four alloys plus two additional alloys.

Alloys were tested in appropriate concentrations using standard laboratory reagents and glassware. Samples, approximately ¼" x 1" x 1½", were ground clean, scrubbed, rinsed, and dried. Cooled specimens were weighed and measured, then exposed. After specified test period, specimens were rinsed, cleaned and dried, cooled, and again weighed.

Effects of complicating factors such as aeration, galvanic action, contamination, and erosion were not considered.

These corrosion keys are intended for rapid preliminary selection of materials. They are not intended to show what is best for a specific service. Manufacturer should be consulted for further information in regard to a given application. For final choice of material, actual field testing is recommended.

CHROMIC ACID

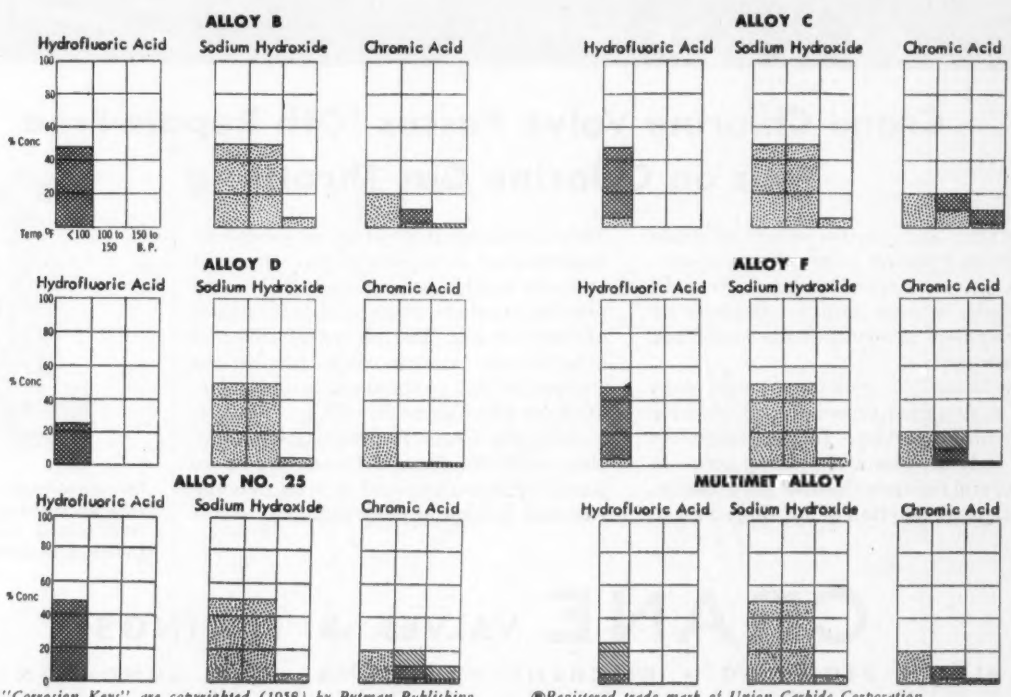


Nominal alloy compositions % by wt*
(not including minor components)

Haynes alloy designation	Ni	Co	Cr	W	Fe
25	9.0-11.0	Balance**	19.0-21.0	14.0-16.0	3.0 max
Multimet	19.0-21.0	18.50-21.0	20.0-22.5	2.0-3.0	Balance**

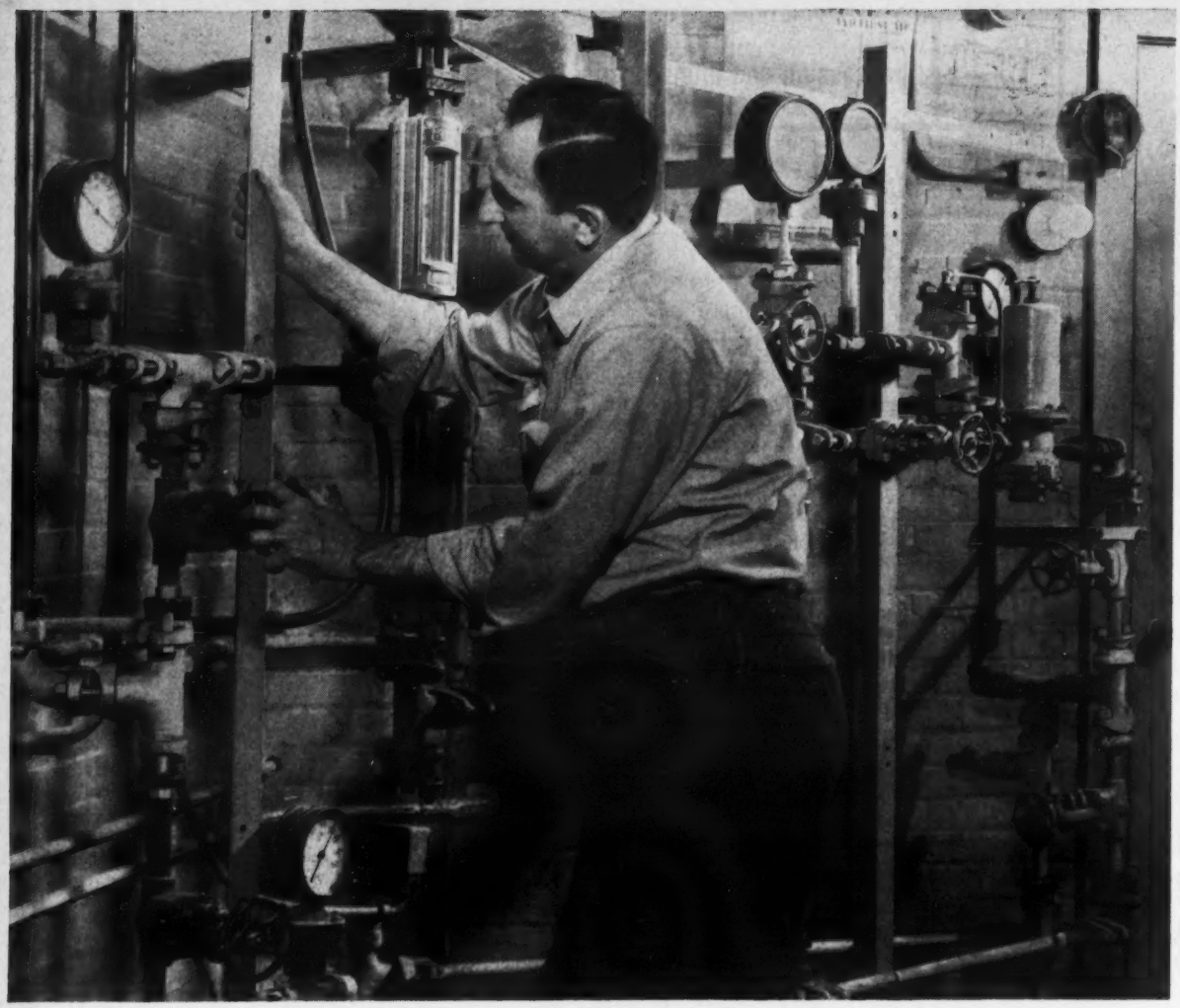
*For compositions of Alloys B, C, D, and F see CHEMICAL PROCESSING, July 1958, page 125.
**Since minor components are not included, "balance" does not mean remainder is entirely element indicated.

(For more information on Hastelloy alloys contact Haynes Stellite Co., Div. of Union Carbide Corp., 420 Lexington Ave., New York, New York.) Check 2202 opposite last page.



"Corrosion Keys" are copyrighted (1958) by Putman Publishing Company.

®Registered trade mark of Union Carbide Corporation



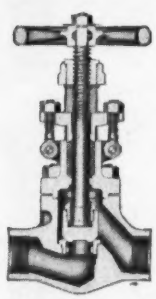
Crane Chlorine Valve Passes 10th Repair-Free Year on Chlorine Gas Throttling

Every time an operator opens or closes the Crane chlorine valve shown above, the Bergstrom Paper Company, Neenah, Wisconsin, is paid another dividend on an investment in service made more than 10 years ago!

This Crane No. 1644 forged steel globe valve is designed especially for chlorine gas or liquid service. In the Bergstrom plant it is used as a throttling valve to control and regulate chlorine gas pressure.

With the exception of a change-over to Teflon packing, this valve has needed no maintenance or repairs in ten years. It operates easily and closes tightly, and permits accurate, close, and safe control of chlorine gas. The record of this and other Crane chlorine valves has led the Bergstrom mill to standardize on the No. 1644 for all chlorine handling.

Ask your Crane Representative about this and other lines of Crane valves for handling hazardous and corrosive chemicals and liquors in your mill.



This rugged forged steel chlorine valve has Hastelloy "C" trim and Teflon packing. Globe or angle patterns; screwed or flanged ends.

CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

Check 2203 opposite last page

NEW SOLUTIONS

From page 60

delivery. Also, it takes longer to weigh, which means that the cement and silica scales would have to hold their weighing in readiness over period of time.

Other problem concerned overall flexibility of operation which was needed. Both manual and automatic controls for each scale were mandatory, as well as for system as a whole.

Solution: To meet need for a complete, automatic, fail-safe system, a series of new timer alarms was installed. These are incorporated at both ends of the weighing/discharge cycle and individually at each of the three scales.

In operation, raw asbestos is fed through blending mixer to an elevator which discharges into a scale. It is then processed through a willow mill and discharged into another bucket elevator along with precisely weighed quantities of cement and silica. These three ingredients enter a blending mixer which discharges and receives material as called for.

Entire process is impulsed from the discharge gate on the blending mixer. When it closes, discharge feeders on the asbestos fiber scale automatically start operating.

Alarms actuate series of lights and bells which alert personnel of a malfunction at any point in feed systems, weighings, proportionings, or discharges. At same time, system automatically shuts down.

A unique suspension-type weigh hopper with slightly relieved sides was designed to prevent asbestos from hanging up. It is supplied with a "live bottom" consisting of 9" quadruple screw discharge to assure even delivery of weighed and proportioned fiber to willow mill.

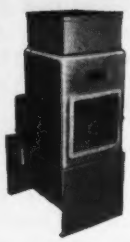
Silica and cement scales are supplied with motorized flush-proof discharge gates which have partial adjustable gate openings. The partial opening is held for a pre-determined length of time to insure smooth and complete outflow of materials. Each weigh hopper is equipped with dial

To page 64

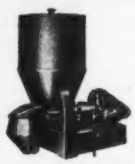
ACCURATE and DEPENDABLE INFILCO Chemical Feeders

FOR PROCESSING... TREATING.... MATERIALS ACCOUNTING...

DRY-COMPACTED DRY-FREE FLOWING

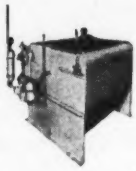


INFILCO type E feeder is specially designed for chemical and food processing. Responds to 1% linear adjustment. Holds feed rate accurately over long periods without supervision. Requires minimum maintenance. Feed rates range from .04 to 8000 lbs./hr.



INFILCO type D feeder utilizes an adjustable knife to "cut" compacted dry chemicals and other solids from revolving table. Feed rates range from .16 to 1840 lbs./hr.

SLURRY SOLUTION



INFILCO Mixer and Feeder delivers uniform solution or suspension. Vertical mixing maintains uniform slurry. Accuracy of chemical content held to 1.5%. Holding capacities from 40 to 3,000 gals. with feed rate range up to 6 gpm.

Pneumatically actuated NEUSOL® feeder handles one or two different solutions at individually controlled rates. Duplex feeder ranges .03 gph minimum (using one pump) to 20 gph maximum (using both pumps). No metal parts exposed to solutions.

PROPORTIONING CONTROLS regulated by time, pH or flow are available for all INFILCO feeders.

INFILCO

INFILCO INCORPORATED TUCSON
Dept. I.S. P.O. Box 5033 ARIZONA

Check 2204 opposite last page

NOVEMBER 1958

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processing and engineering data

Determination of Empirical Formulas

MRS. E. I. SHROFF
6963 San Palo Circle
Buena Park, Calif.

Engineers and chemists frequently determine empirical formulas of organic compounds from carbon, hydrogen, and other element analysis.

Accompanying nomograph provides convenient means of establishing such empirical formulas with sufficient accuracy. It speeds up and simplifies calculations that are laborious.

Typical Example

Use of nomograph is illustrated as follows:

• *What is empirical formula for compound that has the analysis:* $C = 70.59\%$, $H = 5.88\%$, *and* $O = 23.53\%$?

Connect 70.6 on the C_2 scale and 5.9 on the H scale with a straight line. Read number of carbon atoms as 4 on the C_2 scale and number of hydrogen atoms as 4 on the h_2 scale.

Empirical formula is then C_4H_4O. Calculated formula is the same.

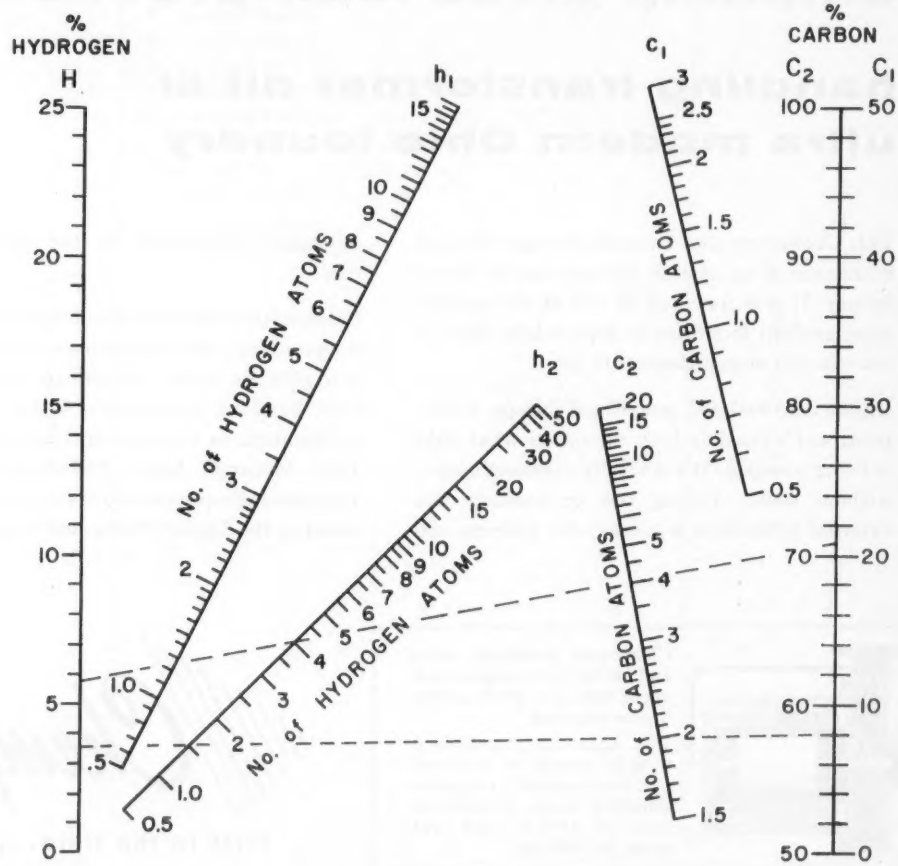
• *What are the percentages of carbon and hydrogen in phthalic acid,* $C_8H_6O_4$?

Basing the operation on one oxygen atom, connect number of carbon atoms, 8/4 or 2, on C_2 scale and number of hydrogen atoms, 6/4 or 1.5, on h_2 scale with a straight line.

Read percentage of carbon as 58 on C_2 scale and percentage of hydrogen as 3.6 on H scale.

Calculated values are C = 57.83%, and H = 3.64%.

NOTE: Use h_1 and c_1 scales with C_1 scale.



From page 62

head and components for remote tape recording of weighings.

Central control panel provides additional flexibility. Fail-safe features are also incorporated into panel. Pilot lights indicate when scales are running, discharging, or have stopped; when batch is completed; and that each scale is back to zero after a discharge. Panel also contains motor starter, relays, timer, weight selector dials, pushbutton, and jog buttons.

Results: Installation of pretested weighing and proportioning equipment incorporating fail-safe features provided time and money savings. Central control arrangement permits remote material and weight selection, and each step in proportioning operation may be followed. Complete dustproof operation is assured by flexible dust sleeves from feeders to hoppers and fully-welded dust-tight construction of control panel.

(Proportioning system was designed, engineered, and constructed by Richardson Scale Co., Clifton, N.J.)

Check 2206 opposite last page.

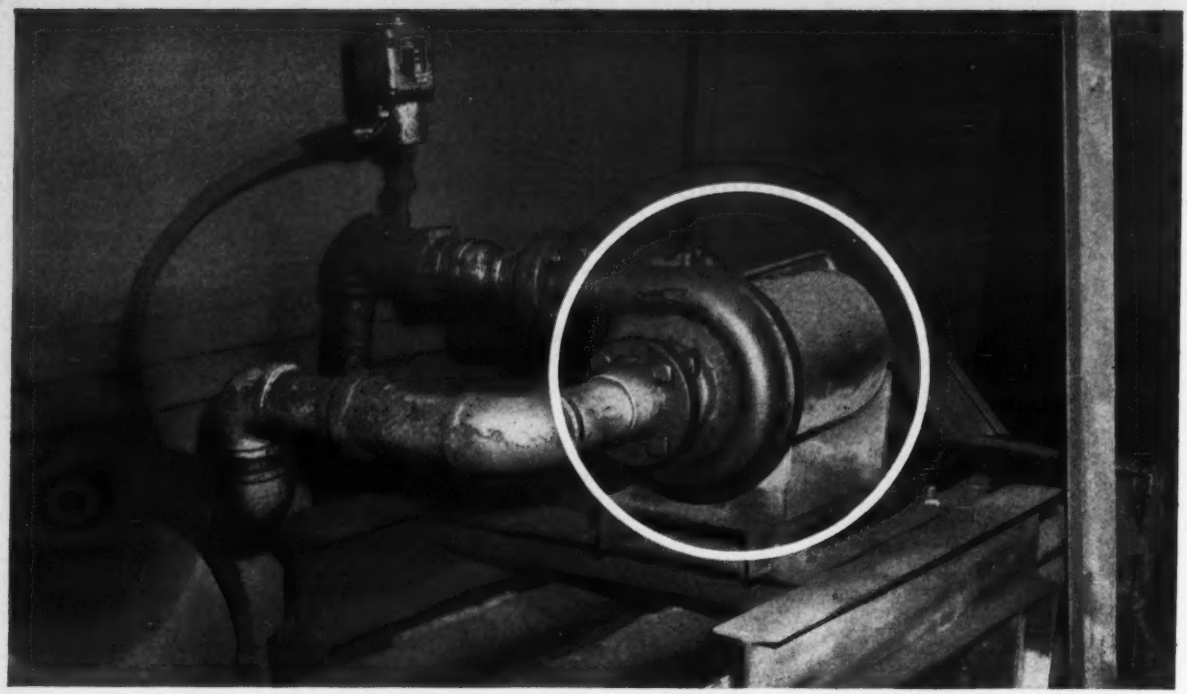
New construction method for sub-soil steam lines cuts cost in half

Eliminates need for concrete conduit and manholes

Up to 50 percent savings in cost of building underground steam lines are reported through use of recently developed technique. Key to slash in cost is elimination of expensive concrete conduit and manholes.

Conceived by Consumers Power Company, Jackson, Michigan, method consists of the following steps: Trench is dug; pipe, including expansion joints and other fittings, is laid; pipe anchors, guides, and supports are installed; then line is packed with granular poured-in-place hydrocarbon insulation, and covered. As

To page 66



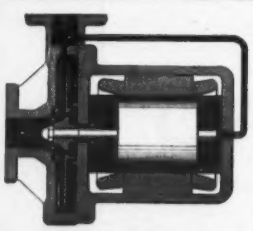
Chempump gives leak-proof service

handling transformer oil at ultra modern Ohio foundry

This *Chempump* circulates oil through the heat exchanger of an electric furnace power transformer. It was installed at one of the world's most modern foundries in September, 1955. *It has required no maintenance to date.*

Unlike conventional centrifugal pumps, *Chempump* can't possibly leak, no matter what fluid is being pumped. It's a totally enclosed unit—without seals, stuffing box or packing. No external lubrication is needed, for bearings are constantly lubricated by the pumped fluid itself.

Chempump's long-term dependability cuts process pumping costs everywhere. Learn how you can gain its many advantages in your own fluid handling application. Write for specific information to Chempump Corporation, 1300 East Mermaid Lane, Philadelphia 18, Pa. Engineering representatives in over 30 principal cities in the United States and Canada.



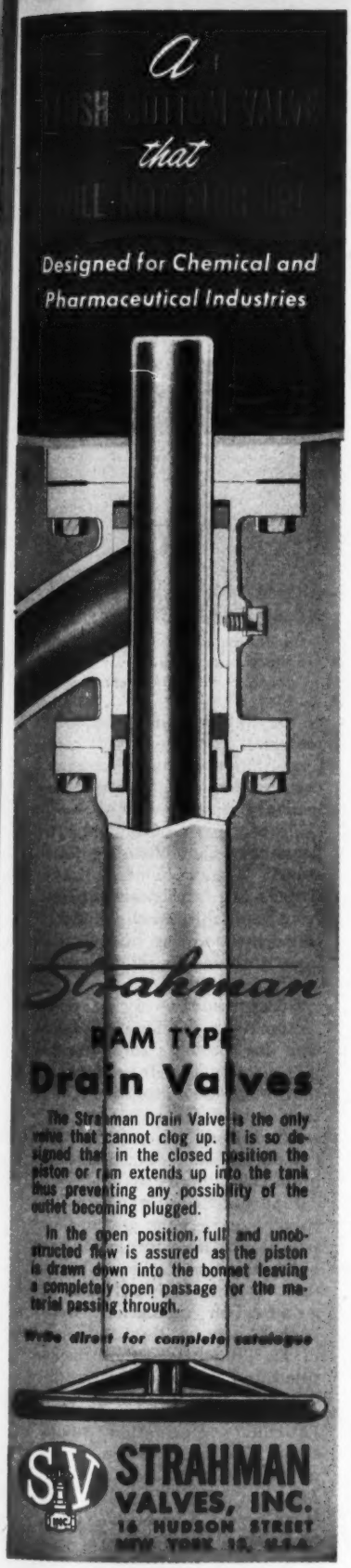
Chempump combines pump and motor in a single, leak-proof unit. No shaft sealing device required.

U.L. approved. Available in a wide choice of materials and head-capacity ranges for handling fluids at temperatures to 1000 F. and pressures to 5000 psi.

Chempump

First in the field...process proved

Check 2205 opposite last page



Check 2207 opposite last page

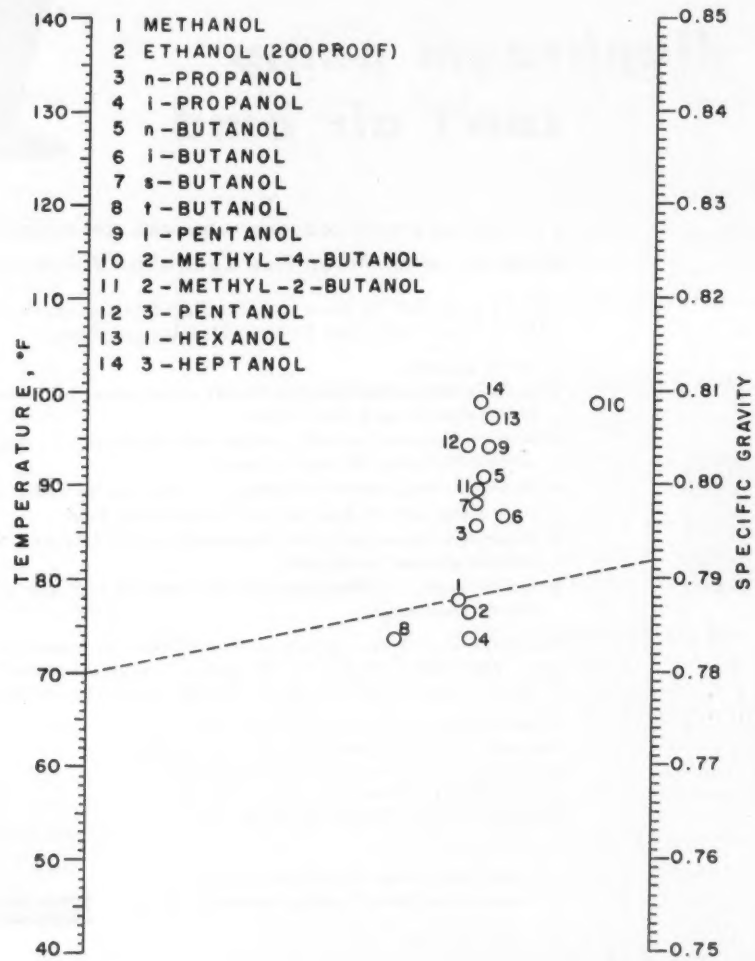
Specific Gravities of Alcohols

J. W. FISH and B. L. PRITCHARD
Bishop, Texas

For most of the common alcohols, specific gravity is linear with temperature. This principle is the basis for accompanying nomograph, which presents an easy method for determining specific gravities of 14 more common alcohols at temperatures between 40 and 140°F.

Typical Example

Dotted index line on nomograph shows that the specific gravity of methanol (gage point 1) is 0.792 at 70°F.



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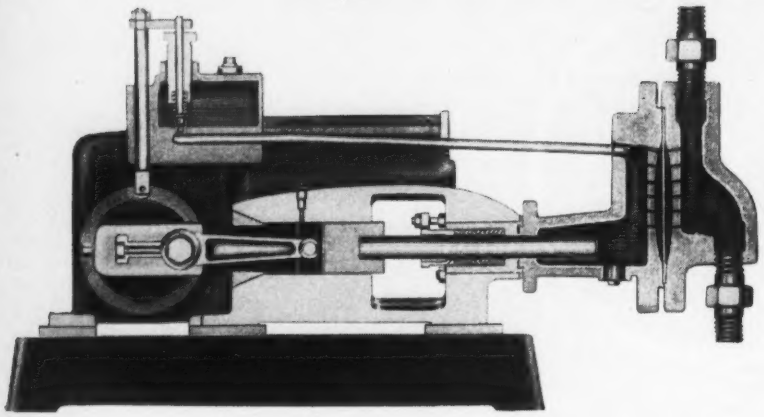
2) LANGE, N. A., Editor, *Handbook of Chemistry*, 8th Ed, p 364, Handbook Publishers, Inc., Sandusky, Ohio, (1952).

3) SCHEFLAN, L., and JACOBS, M. B., *The Handbook of Solvents*, D. Van Nostrand Co., Inc., New York (1953).



This diaphragm pump can't air bind

. . . one of many reasons why you get reliability and accuracy with Milton Roy Controlled Volume Diaphragm Pumps

Take a good look at these outstanding features of the new Milton Roy Controlled Volume Diaphragm Pump:

- **no air pockets.**
- **positive mechanical valving bleeds air or vapor from hydraulic fluid automatically once each stroke.**
- **uniform pressure on both suction and discharge . . . diaphragms move without tendency to twist or bend.**
- **non-lubricating hydraulic system . . . fluid can be water, or other liquid.**
- **no moving parts to beat air into the hydraulic fluid.**
- **diaphragm liquid ends interchangeable in the field with Milton Roy packed plunger liquid ends.**
- **monel fillers . . . effectively seal and prevent cold flow of the plastic diaphragm.**

Standard liquid end designs are available for pressures to 1,000 psi and capacities from 1.1 to 138 gph . . . manual or automatic 0-100% capacity adjustment. Higher capacities available.

Take another look at the Milton Roy approach to your metering and pumping problems . . . write for detailed information to Milton Roy Company, 1300 East Mermaid Lane, Philadelphia 18, Pa.

Controlled Volume Pumps • Quantichem Analyzers
Chemical Feed Systems • Anders Air and Gas Dryers

milton Roy
CHEMICAL INSTRUMENTATION SYSTEMS

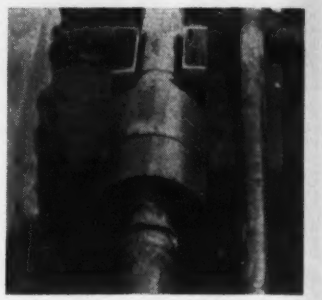
Check 2208 opposite last page

NEW SOLUTIONS

From page 64

line is heated, insulation cures to a 3-layer protective and insulating covering.

Biggest stumbling block in the past for use of such a system was the expansion joints. Conventional packless corrugated types could not readily be fitted with covers which would protect the corrugated



Uncovering portion of line, after 8 months use, showed that cover provided complete protection

elements from loose insulating material. The joints had to be placed in a manhole or concrete box in order to function properly.

Development of a compact, package-design expansion joint solved the problem. Unit's flanges are fabricated entirely from weldable wrought steel. Since there are no bulky castings on them, the joints can be easily covered.

Recent uncovering of a 4′ section of a 75′ long 3″ diam test line proved technique to be a success. Careful examination of the line, after 8 months service, indicated that no insulation had entered cover of expansion joint and that unit functioned perfectly.

Pipe had been laid in a 30″ trench connecting steam distribution main with a building of the Saginaw Business Institute. Two and a half tons of granular insulation were packed around line to depth of 4″. Trench was then backfilled and line placed into operation.

(Further information about steam line construction method is available from Badger Manufacturing Company, 230 Bent Street, Cambridge, Massachusetts; manufacturers of S-R steam expansion joints.)

Check 2209 opposite last page.

Latest step taken to bring polyvinyl chloride out in the open by combatting destructive attack of ultraviolet light was made by American Cyanamid Company. Introduction of . . .

improved UV absorber ups PVC life

Outdoor exposure tests in Arizona and Florida sunlight have proven effectiveness of an improved UV light absorber in protecting clear polyvinyl chloride from the destructive attack of ultraviolet light.

Previously available materials markedly increased outdoor life of clear vinyls. These absorber-protected sheets resisted spotting for 1496 ultraviolet sun hours in Florida sunlight, equivalent to twelve months outdoor use (See CHEMICAL PROCESSING, June 1957, page 53).

Now protection has been extended to eighteen months or more with 2,2'-dihydroxy-4-methoxybenzophenone, (Cyasorb UV 24 light-absorber). Only 0.1-0.2 phr is required to achieve this protection. At these concentrations the pale yellow powder does not affect color or clarity of PVC.

Preliminary laboratory data indicate that compound is beneficial in thin vinyl films. By incorporating absorber in a film, the thin plastic becomes an ultraviolet-opaque screen. This protects not only the film itself but also the substrate or other UV-sensitive materials behind the film.

Cyasorb UV 24 is particularly effective at low end of sunlight spectrum (300-380 millimicrons). It does absorb partially in usable concentrations in high end of ultraviolet portion (380-400 millimicrons).

Prior to outdoor testing, a typical vinyl formulation containing 0.2 phr of Cyasorb UV 24 was exposed in a Fade-Ometer until spotting began. High efficiency of absorber was indicated by exposure time elapsed before tenth spot appeared.

	Unprotected	Protected
Hours to first spot	140	680
Hours to tenth spot	220	1800

These results were confirmed in outdoor exposures.

Now a commercial product, quantity-lot price of UV absorber is $7.50/lb. At lower concentration required, compound provides a six month increase in outdoor life of resin compared to previously used materials at a cost of less than ½c/lb.

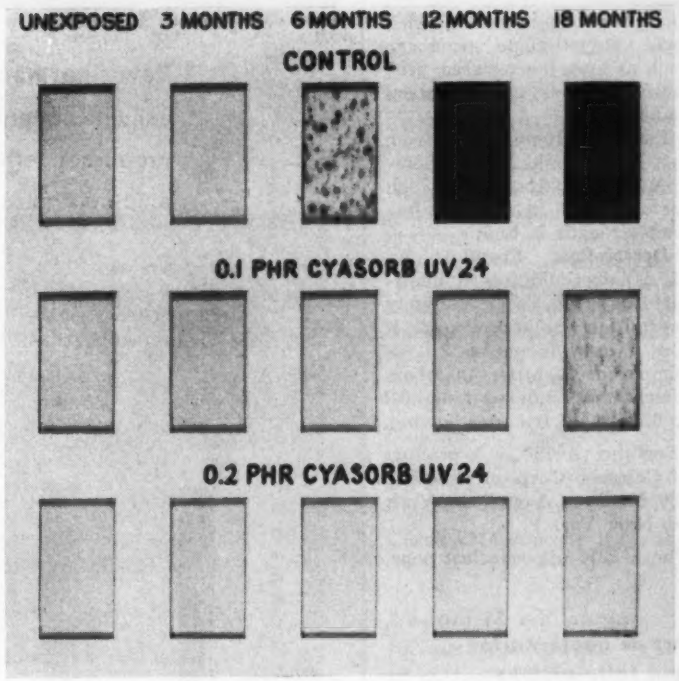
(Cyasorb UV 24 is a product of Intermediates Dept., American Cyanamid Company, Bound Brook, N.J.)

Check 2210 opposite last page.

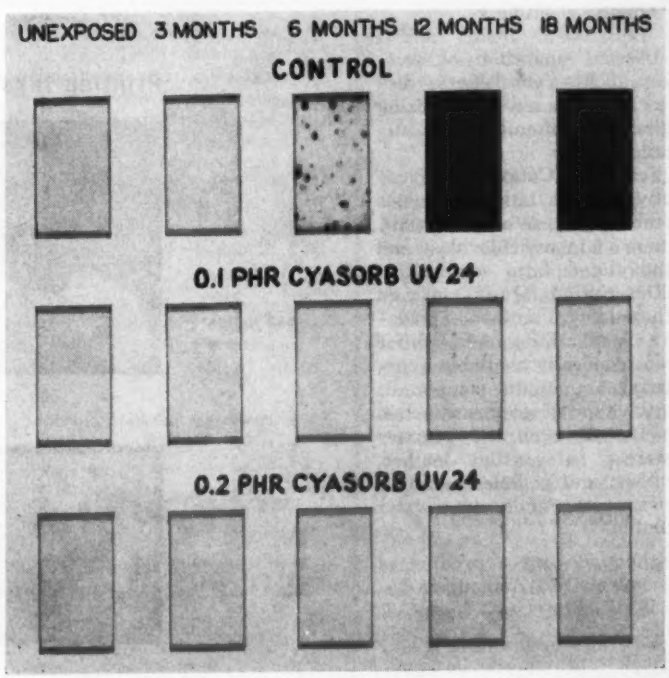
Clear PVC Resin Formula

	Parts
Polyvinyl chloride resin	100
Dioctyl phthalate	50
Ba-Cd laurate	2
Aryl phosphite	1
Cyasorb UV 24 light absorber	(As noted)

After dissolving the absorber in the plasticizer, the compounds were conventionally blended and hot-rolled, then molded into 50-mil sheets in a 325°F press



Close-up of clear vinyl test panels exposed to Arizona sunlight



Test panels exposed to Florida sunlight

Adds fourth member to polyolefin series

For intermediate-sized injection molded items

Uses: For making intermediate-size injection molded rigid polyethylene products, such as toys, housewares, protective helmets, and industrial components.

Features: Items made from this resin combine easy flowability in molding and a high surface gloss. In addition, impact strength is high.

Description: Fortiflex A-250 is latest addition to manufacturer's series of highly crystalline polyethylenes. It has a melt index of 2.5, as compared to other members which have indexes from 0.2 to 0.7, thus it is easier flowing.

(Fortiflex A-250 is a product of Celanese Corp. of America, 180 Madison Ave., New York 16, New York.)

Check 2211 opposite last page.

Act as quaternaries and fatty amines in application

Make more effective wetting agents, emulsifiers

Uses: Preparation of wetting agents, emulsifiers, dispersing and solubilizing agents; as softening and antistatic agents.

Features: Cationic surface-active agents have properties combining those of quaternary ammonium chlorides and ethoxylated fatty amines.

Description: Quarternized ethoxylated amines, trademarked Ethoquads, differ from generally available quaternary ammonium compounds in the type of groups attached to the nitrogen. Of primary interest to textile, leather, rubber, and petroleum industries, compounds are water soluble.

(Ethoquads are a product of Chemical Div., Armour & Co., 1355 W. 31st St., Chicago 9, Illinois.)

Check 2212 opposite last page.

MIN CHE ...news briefs

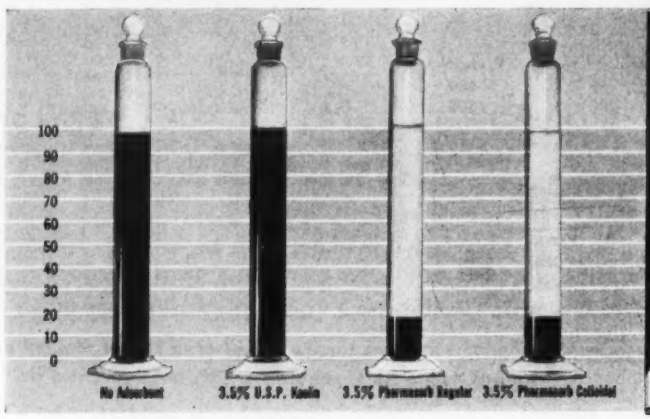
ON THE CREATIVE USE OF NON-METALLIC MATERIALS

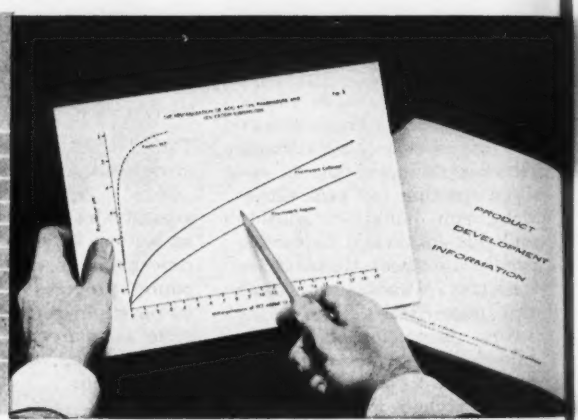
***New Pharmaceutical Ingredient**

exhibits superior adsorptive properties, effective acid neutralization

Latest development of M & C research is Pharmasorb—highly refined activated attapulgite available in two pharmaceutical grades. A big factor that makes Pharmasorb so attractive for pharmaceutical preparations is its high sorptivity. Laboratory photo illustrates its ability to adsorb methylene blue. Pharmasorb is approximately five to eight times superior to kaolin as an adsorbent for strychnine and quinine . . . approximately five times superior to kaolin in adsorbing diphtheria toxin. Pharmasorb also possesses outstanding acid neutralization properties over a wide pH range. This is a "*starred*" item. Use the coupon.

METHYLENE BLUE ADSORPTION TEST
(120 mg./100 ml. Methylene Blue)





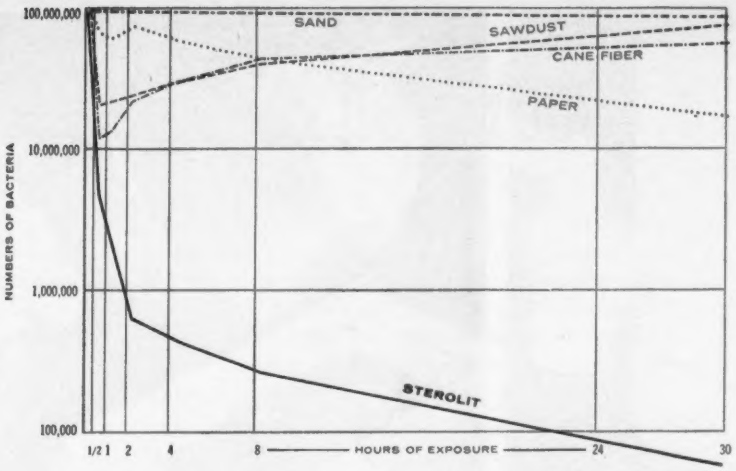
Printing Inks get top grinding and press behavior with new Surface Modified ASP's

M & C's new organophilic Surface Modified materials offer striking advantages in those ink systems requiring good flow and length. Viscous inks employing polar vehicles gain improved resistance to emulsification, excellent press behavior and printing qualities. Fluid inks benefit primarily from the distinctly superior suspension properties of Surface Modified ASP's. Whatever your requirements or type of vehicle, M & C offers quality-controlled extenders—the new Surface Modified organophilic types or unmodified hydrophilic pigments.

MINERALS &
CORPORATION OF AMERICA
Leaders in creative use of non-metallic minerals

*Research Using Laboratory Animals: new M&C bedding resists bacteria growth, improves test accuracy, control

Graph shows the high bacteria killing power of Sterolit®—M & C's new self-sanitizing and odor-killing animal bedding processed from attapulgite. Sterolit is free from living microorganisms as produced—will not support the growth of bacteria, thus improving the accuracy and control of tests results. Recent cost studies conducted in a government laboratory (details on request) show that total material and labor costs for Sterolit are approximately 39% of those for sawdust. This permits laboratories to maintain *more* animals at the same costs and with the same labor force. This is a *starred* item. Use the coupon.



Paint Manufacturers: gain outstanding durability with M&C's 6-year tested ASP extenders

Test fence readings prove that M & C's Aluminum Silicate Pigments are superior for outside house paint formulations. *Here's why:* high over-all performance rating based on general appearance, gloss, checking, cracking, dirt collection, mildew and flaking. See for yourself—use the coupon for a copy of the 12-page bulletin that tells the whole story.

Hard-top Cab of Reinforced Plastic uses Surface Modified ASP filler for formulating ease

Problem: achieving molding ease of large parts in laminating and gel coat operations.

Solution: M & C's organophilic Surface Modified ASP filler.

Results: excellent wet out, reduced viscosity, no agglomeration troubles plus highly favorable gel and cure times, and superior surface characteristics to withstand the rigors of road service. Do you have molding problems in your operation? Investigate M & C's family of fillers . . . new 21-page data folder, TI-1026, gives all details. Use the coupon for a copy.

Use this quick two-check coupon ▶

✔ your product interest . . .
✔ what you need to get tests started . . .
we'll fill your requests immediately.

For more data, see your Chemical Materials Catalog, Pages 358-362

CHEMICALS

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I'm interested in:
* ☐ Pharmaceutical Ingredients; * ☐ Laboratory Animal Bedding; ☐ Reinforced Plastic fillers; ☐ Printing Ink extenders; ☐ Outside House Paint extenders.

Please send, without obligation:
☐ data; ☐ samples; ☐ prices; ☐ technical representative

name_____
title_____
company_____
address_____
city_____ zone_____ state_____

Check 2213 opposite last page

*Plasticizer provides maximum permanence for vinyls

High polymeric product resists extraction

Uses: Plasticizer is designed for use in vinyls, particularly where they will be used in adhesives, cable jackets, gaskets, or similar products.

Features: High-polymeric plasticizer provides maximum permanence and stability. It resists extraction by soapy water or solvents and has a maximum resistance to migration.

Description: Product is a clear liquid with a mild odor. Designated Harflex 375, it is compatible with vinyl chloride polymers and copolymers, nitrocellulose, and synthetic rubbers.

(Harflex 375 polymeric plasticizer is product of Harchem Div., Wallace & Tiernan Inc., PO Box 178, Newark 1, N.J.)

Check 2214 opposite last page.

*Treated 10 million gal for each cubic foot of softening resin

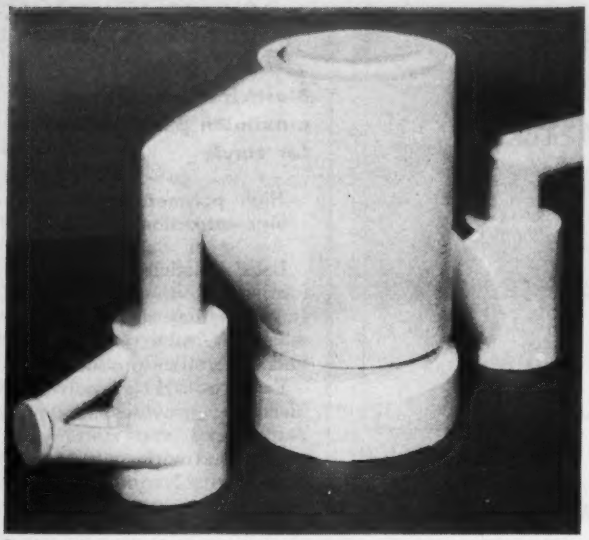
No deterioration is visible after eight years service

Pilot plant installation of water-softening resin has treated an estimated flow of 10 million gallons of water for each cubic foot of resin without appreciable deterioration or discoloration of the resin. These results, obtained at Metropolitan Water District of Southern California, LaVerne, Calif., give promising indications of a long useful life for water-softening resins in large-scale operations.

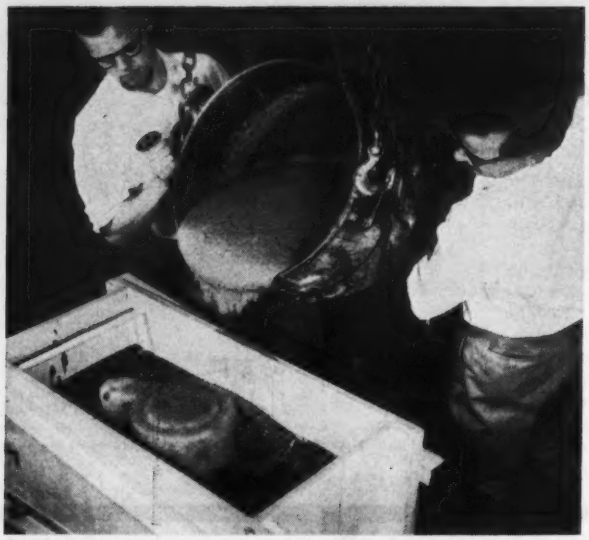
Polystyrene ion exchange resin system softens Colorado River water for 28 communities in Southern California. System has cycled through 6000 regenerations with salt.

(For more information on Duolite C-20 ion exchange resin contact Chemical Process Company, 1801 Spring St., Redwood City, Calif.)

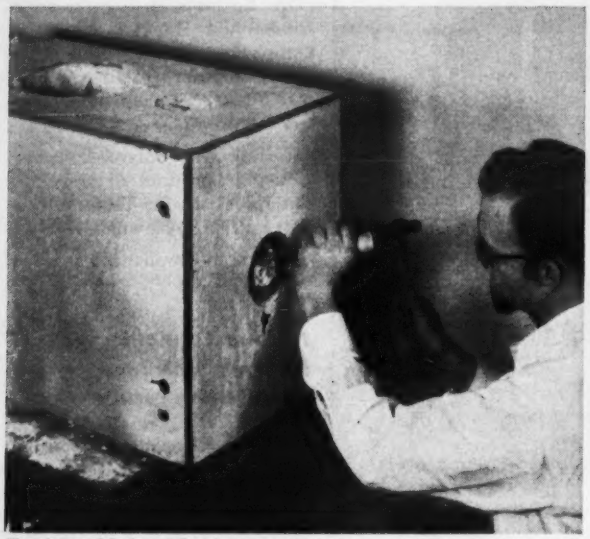
Check 2215 opposite last page.



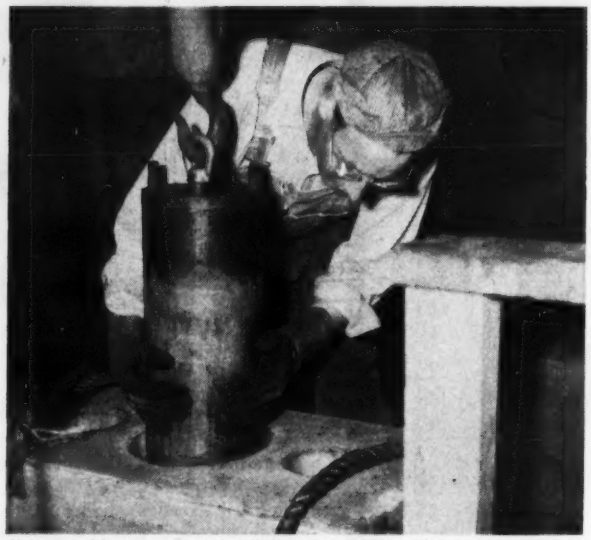
To shape the inside of the bromide-bromine liquor pump block, a form is made of plaster of Paris and Styrofoam®.



Dow Epoxy Resin 331 (casting formulation supplied by Ren Plastics, Inc.) is poured over the form and hardens.



The plaster of Paris and Styrofoam material in the form is broken up and removed.



Main part of bromine pump is installed, ready to operate without wear or corrosion!

Dow Epoxies help stop corrosion for chemical processors

This corrosion-free pump block adds another to the list of success stories made possible by new, pure Dow Epoxy Resins.

For years the main parts of bromide liquor pumps have been made with machined soapstone. Performance was inconsistent; the slightest crack or seam proved disastrous. But now Dow Epoxies open a new era of efficiency and economy for the chemical processing and corrosion fields. Easily cast to shape without costly machining, the epoxy pump blocks are impervious to the chemicals involved and free from the internal flaws of soapstone.

Have you a corrosion problem where Dow Epoxies may help? Write for information and technical help. Dow is a basic producer of the raw materials used in epoxy production. In this way Dow provides raw materials with optimum properties to produce superior resins, to control quality carefully and to provide a narrower range of specifications in the finished resin—so necessary to uniform performance. For complete information and technical data on Dow Solid and Liquid Epoxy Resins, consult your Dow sales office. Or write THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Department 2265Q-1.

EPOXY T.M.

YOU CAN DEPEND ON DOW

Check 2216 opposite last page

Free fatty alcohols and fatty acids in blends

Sperm-oil-derived products can react separately

Uses: Compounds should be useful as emulsifiers, lubricants, superfatting agents, detergents, amines, and other reaction products.

Features: Blend contains free fatty alcohols and free fatty acids. Each can be reacted independently or together.

Description: Products, called Oleyl-acids and Cetyl-acids, are derived from a sperm oil and contain a small amount of esters. Eutectic blends have a much lower melting point than most saturated fatty acids or fatty alcohols, about 45°C. It has the feeling of a hard, tough, waxy fat. Ethylene oxide adducts of these products are also available in three-mol, five-mol, and ten-mol weights.

(Oleyl-acids and Cetyl-acids are available from Werner G. Smith, Inc., 1730 Train Ave., Cleveland 13, Ohio.)

Check 2217 opposite last page.

Variety of applications for heterocyclic polyamines

Economical mixtures of heterocyclic polyamines based upon the piperazine nucleus and containing some aliphatic polyamines are now commercially available in three grades — Amine AL-1, Amine AL-F, and Amine AL-2. N-Aminoethylpiperazine, their largest single constituent, is also available in tank car quantities in a relatively high degree of purity.

All are excellent curing agents for epoxy resins. They are useful intermediates in the preparation of corrosion inhibitors, asphalt additives, emulsion breakers, and surfactants.

These polyamines impart good flexibility and high impact strength to epoxy resin castings, laminates, and surface coatings.

N-Aminoethylpiperazine, available in 95% minimum purity, has the following typical analysis:

Aminoethylpiperazine, wt.% (by vapor chromatography)	98.0
Color, Pt-Co Scale	25
Molecular Weight (by titration)	128.5
Specific Gravity, 20/20°C	0.984
Refractive Index, 20°C	1.4999
Boiling Range, ASTM, °C	
IBP:	214.8
5%:	217.8
95%:	221.0
DP:	221.8

Polyamine mixtures available in progressively less highly refined forms and lower prices are: Amine AL-2 containing 60-65% aminoethylpiperazine, Amine AL-F containing 40-45% aminoethylpiperazine, and Amine AL-1 containing 34-38% aminoethylpiperazine. The other constituents are aliphatic and heterocyclic polyamines; no aromatic amines are present.

(Amine compounds are products of Jefferson Chemical Company, Inc., 1121 Walker Avenue, Houston 2, Texas.)

Check 2218 opposite last page.

Three biochemicals made available

Now available in pilot plant quantities are three biochemicals.

γ-L-glutamic acid hydrazide is structurally similar to glutamine and glutamic acid. Molecule has its γ-carboxyl group blocked. It is moderately soluble in water.

Lysine dihydrochlorides (both L- and D,L isomers) are solid sources of hydrochloric acid. Molecule is doubly active since lysine monohydrochloride has been shown to promote pepsin and hydrochloric acid secretion in humans. Compounds are very soluble in water.

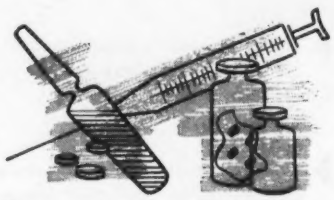
(Glutamic acid Hydrazide and lysine dihydrochlorides are available from Central Research Laboratories, General Mills, Inc., 2010 E. Hennepin Ave., Minneapolis 13, Minn.)

Check 2219 opposite last page.

How Can CO_2 Help You?

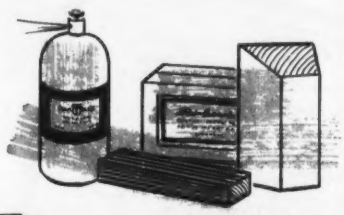
"CO_2 applications are unlimited"... a broad statement, but literally true. New ways in which this most versatile of all gases is improving products, cutting costs and saving time and labor are being developed almost daily. Some of the applications discussed here will be of direct, primary interest to you. Other uses, while perhaps not in your immediate specialty, may well be *adaptable* to your field. Check the box by each application on which you'd like detailed, technical data and mail this coupon.

Your inquiry will receive prompt, professional attention from the chemical applications staff of the world's largest producer of CO_2.



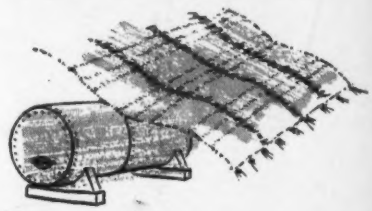
☐ ▶ **Economical, Efficient "Freeze-Drying"**—Freeze-drying is used to dehydrate heat sensitive substances at low temperatures. In the processing of blood plasma and the manufacture of penicillin, streptomycin and other pharmaceuticals, dry ice or liquid CO_2 is used to freeze the item being dried. Also, during the drying stage, dry ice is used to condense the moisture as it is sublimed under vacuum. Capable of quickly attaining and maintaining the extreme low temperatures required, CO_2 has the added advantage of requiring only a small capital outlay.

☐ ▶ **Precipitation of Carbonates**—Carbon dioxide in its gaseous form is used to precipitate carbonates from water solutions. Ammonium bicarbonate and lead carbonate are examples. Bakeries and plastics manufacturers are among the many users of ammonium bicarbonate.



☐ ▶ **Simplifies Pulverizing of Materials With Low Melting Point**—Many substances tend to melt or smear because of the heat generated in a milling process. DDT and vegetable fat flakes which are waxy and Teflon resin which is very tough and elastic are examples. In the low temperature pulverizing process the ingredient is mixed with crushed dry ice or low pressure carbon dioxide liquid is injected directly into the ingredient. These methods effectively inhibit the melting or smearing, prevents plugging and reduces horse power requirements. Gaseous carbon dioxide is also used to form an atmospheric "blanket" to effectively prevent fire during the grinding of flammable materials. An example of this application is the grinding of phosphorus pentasulphide and flammable resin materials.

☐ ▶ **Fireproof "Blanket" For Stored Phenol**—Phenol is a toxic, corrosive, flammable compound and is stored in an inert atmosphere under slight pressure to reduce vaporization, prevent oxidation and at the same time provide a non-flammable atmosphere. Carbon dioxide is also used as a pressure medium in transferring liquid phenol.



☐ ▶ **Effective Inerting Agent**—There are many times when an inert atmosphere is needed to prevent fire or explosion. Before welding a tank that has been used for the storage of flammable liquid, CO_2 is used to inert the atmosphere in the tank so that welding can be done with no danger of explosion. CO_2, acting as an effective atmospheric "blanket," also prevents oxidation and "skinning" of paints and oils.

SEND IN THIS COUPON FOR COMPLETE INFORMATION

Check off the applications which interest you, fill in name and address, and mail the coupon to Liquid Carbonic for prompt information. You'll also receive a free copy of our Booklet, "Applications Unlimited", which covers dozens of other important uses of CO_2.

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☐ Fireproof "Blanket" For Stored Phenol
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Check 2220 opposite last page

WESTERN PRECIPITATION'S

NEW

THERM-O-FLEX COLLECTOR

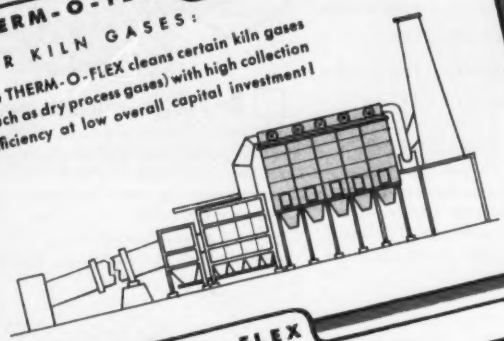
CLEANS GASES TO 550°F

with VIRTUALLY 100% COLLECTION!

THERM-O-FLEX

FOR KILN GASES:

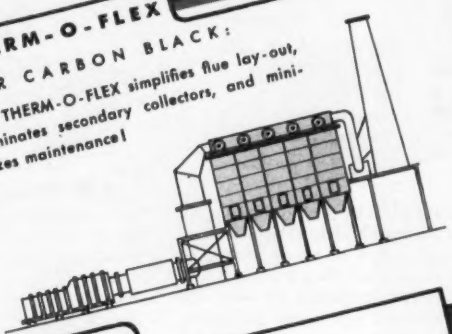
The THERM-O-FLEX cleans certain kiln gases (such as dry process gases) with high collection efficiency at low overall capital investment!



THERM-O-FLEX

FOR CARBON BLACK:

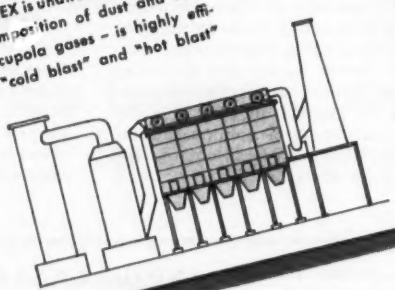
The THERM-O-FLEX simplifies flue lay-out, eliminates secondary collectors, and minimizes maintenance!



THERM-O-FLEX

FOR CUPOLA GASES:

The THERM-O-FLEX is unaffected by the varying chemical composition of dust and fume particles from cupola gases – is highly efficient on both "cold blast" and "hot blast" processes!



Western-Precipitation brings another important new advancement to the gas cleaning field — the THERM-O-FLEX Collector — a filter type of unit with many advantages over conventional filter equipment...

▶ The THERM-O-FLEX features glass silicone treated filter tubes that efficiently handle gases as hot as 550° F!

▶ The THERM-O-FLEX tubes are cleaned *automatically* by intermittent collapsing (not by destructive shaking). This assures uniformly low pressure drop combined with long filter life!

▶ The THERM-O-FLEX has *no moving parts* — nothing to require frequent servicing or replacement!

RESULT — highest collection efficiency combined with lower cost, less maintenance and uniformly low pressure drop on a wide range of applications, a few of which are shown at left.

Let Our Experienced Engineers study *your* dust or fume collection problem — *large or small* — and show exactly how **THERM-O-FLEX** gives new standards of performance at low installation costs. No obligation, of course!

THERM-O-FLEX literature will gladly be sent. Write or phone, the Western-Precipitation office nearest you.

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COTTRELL Electrical Precipitators
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THERM-O-FLEX Hi-Temp Filters
TURBULAIRE-DOYLE Scrubbers
HOLO-FLITE Processors
HI-TURBIANT Heaters

Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries

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Representatives in all principal cities

Precipitation Company of Canada Ltd., 8285 Mountain Sights Avenue, Montreal 9

Check 2221 opposite last page

CHEMICAL MATERIALS

Aliphatic chemical line is covered in 52-page catalog that is intended as technical reference for experienced users of chemifats. Contained are test data and what is said to be the first commercial presentation of gas chromatographic composition data on olefins, hydrocarbons, fatty alcohols, and hydrogenated fatty acids. Bul 911 is available on company letterhead request to Chemical Products Division, Archer-Daniels-Midland Company, Box 839, Minneapolis 40, Minn.

For nuclear industry, and commercial uses — zirconium hydrides

High-purity material has less than 0.01% hafnium

Two additional grades of high-purity zirconium hydride are now available.

MHI Grade R, for the nuclear industry, contains less than 0.01% hafnium. It can be mixed with other powders and compacted for unusual fuel elements. Equilibrium dissociation pressure is less than one atmosphere at 900°C. Possible uses include application in fluidized-bed reactors as a moderator.

MHI Grade C is used as a finely divided powder in electronics, pyrotechnics, and related fields. In powder metallurgy, it provides a pure hydrogen source to prevent oxidation.

(Zirconium hydride grades R and C are available from Metal Hydrides, Incorporated, Congress St., Beverly, Mass.)

Check 2222 opposite last page.

Raw materials savings possible with emulsion for latex products

Can be used as complete vehicle or modifier

Uses: Resin emulsion can be used as a complete vehicle or as a modifying agent. It is designed to increase profitability and use of emulsion paint.

Features: Material is reported to be one of the lowest cost film formers available. Formulations of resin in other latex base materials meet

highest quality standards for scrubbability, flexibility and freeze-thaw, at a raw materials cost far below cost of latex materials used alone.

Description: Hydrocarbon resin emulsion, designated W-617, is an anionic emulsion of a hydrocarbon copolymer resin. It is compatible with latex materials.

Used with acrylic or styrene-butadiene latexes, it gives emulsion paints improved leveling and brushing properties without adding detrimental properties common to other modifying agents. Color and stability are comparable to base emulsions in order and magnitude.

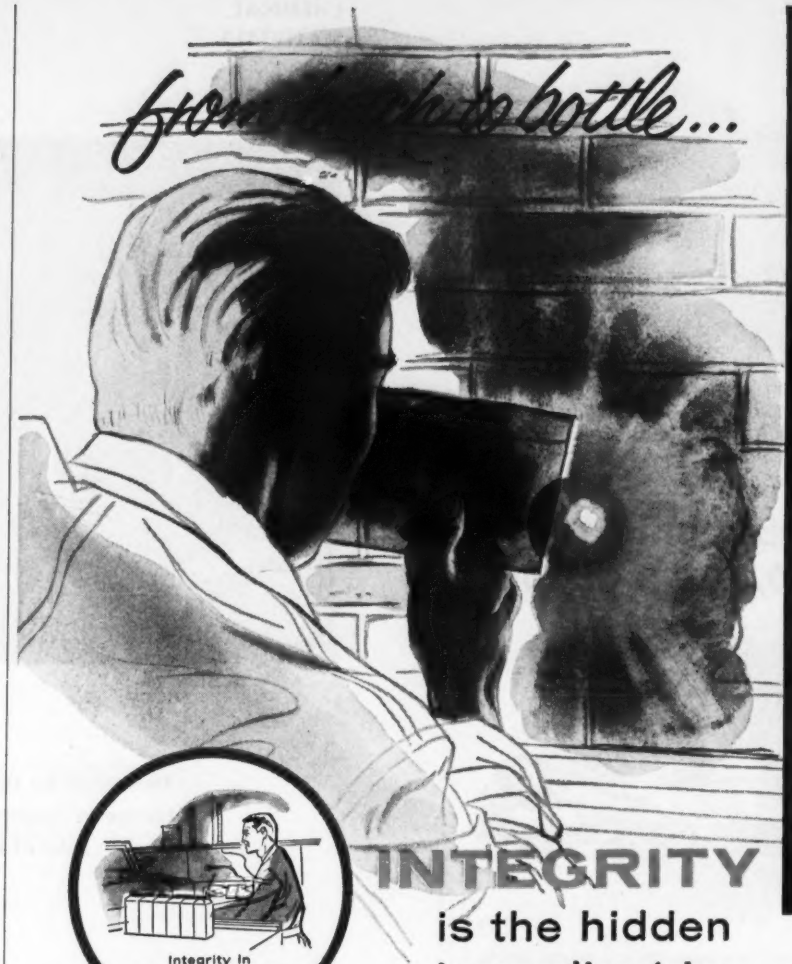
(Hydrocarbon resin W-617 is product of Velsicol Chemical Corp., 330 E. Grand Ave., Chicago 11, Illinois.)

Check 2223 opposite last page.

Methyl butynol and methyl pentynol are covered in 60-page bulletin that includes physical properties, storage and handling, toxicity, methods of analysis, chemical properties and applications. Applications section of 30 pages describes major uses, especially detailing uses of solvents for various resins. Form ADC 5000 — Air Reduction Chemical Company, Division of Air Reduction Company, Inc., 150 East 42nd Street, New York 17, N. Y.

Check 2224 opposite last page.

"... the technical magazines are finally bound and sent to be (sigh) stacked!"



INTEGRITY
is the hidden
ingredient in
Trona® SODA ASH

There's an important ingredient in Trona SODA ASH that's hidden to the eye, does not show up in laboratory analyses or photomicrographs. Yet, from batch to bottle, this ingredient—the *integrity* of Trona Soda Ash—is vital to the glassmaker's art. Trona integrity works for you three ways. Our constant striving for superior quality contributes to the continued improvement of your own end-products. Our Sales and Production departments work as a team to make delivery *when* you want it and *how* you want it. Our glass technology section provides you with specialized technical service on a confidential basis to help you cut costs and improve your process to meet today's changing market. You'll benefit through the integrity inherent in Trona Soda Ash and Trona service. We'll be glad to show you how.

TRONA **American Potash & Chemical Corporation**

3000 WEST SIXTH STREET, LOS ANGELES 54, CALIFORNIA

OFFICES: LOS ANGELES, NEW YORK, CHICAGO, SAN FRANCISCO, PORTLAND (ORE.), ATLANTA, COLUMBUS (O.), SHREVEPORT

Producers of: BORAX • POTASH • SODA ASH • SALT CAKE • LITHIUM • BROMINE • CHLORATES • PERCHLORATES • MANGANESE DIOXIDE • CERIUM • RARE EARTHS • THORIUM
and other diversified chemicals for Industry and Agriculture

Check 2225 opposite last page

Probably unusual in 10,000,000 B.C., too!

The life line of this monster is modern, but it has a "two-headed" characteristic that may be useful to you. It is called Nalquat G-8-13; a quaternary ammonium chloride that is soluble in *both* hydrocarbons and water. It makes clear solutions in water and most hydrocarbons at concentrations of 50% or higher... a highly unusual feature for a high-molecular-weight electrolyte. In fact, we know of *no other* ionic surfactant so endowed.

Among its known uses, it is an excellent emulsifier—especially for tough customers like orthodichlorobenzene ... a corrosion inhibitor in acid systems (particularly where oil is present) ... a dispersant for carbon black and fillers in rubber ... and a fine bactericide, even in solutions below pH7.

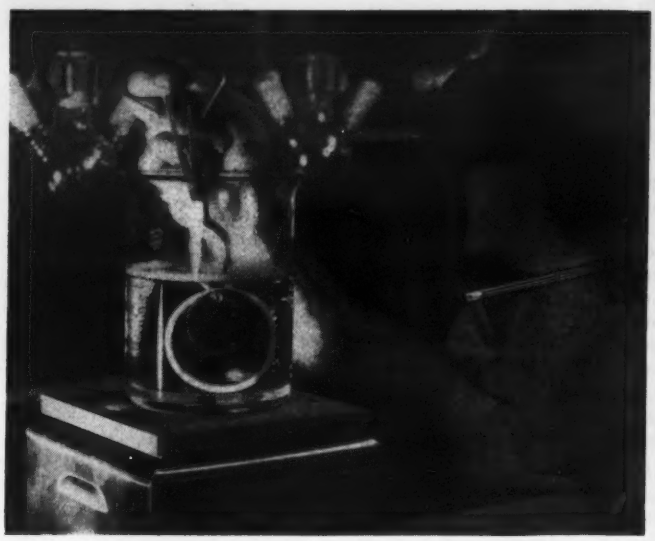
If Nalquat G-8-13 sounds as if it might have possibilities in your projects, products or processes, let us send you full details, with a sample, if you wish.

NATIONAL ALUMINATE CORPORATION

6294 West 66th Place, Chicago 38, Illinois
In Canada: Alchem Limited, Burlington, Ontario

Nalco® PRODUCTS *Serving Industry through Practical Applied Science*

Check 2226 opposite last page



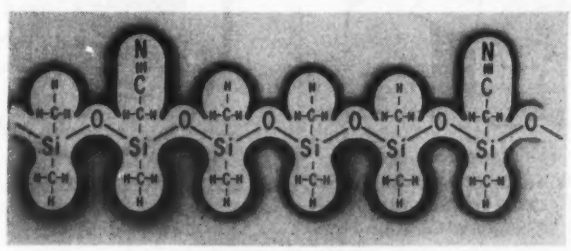
Described by the developers as a 'major advance in chemistry', this heat-, oil-, and solvent-resistant product is a . . .

"A unique combination of important properties never before available in a single material" were the words used in introducing nitrile silicone rubber. Specifically, what are these properties?

- Oil, fuel, and solvent resistance.
- Retaining strength at high temperatures (over 500°F).
- Low temperature flexibility (to −100°F).
- Easily processed in ordinary rubber fabricating equipment.
- Basically a lower cost material than other high-temperature, oil-resistant rubbers. Introductory price for low gravity compounds ready to fabricate will be approximately $15/lb.

Although nitrile silicone rubber was developed with the aircraft industry in mind, petroleum, chemical, and other industry applications should be extensive. Of particular interest will be oil- and solvent-resistant O-rings, seals, gaskets, and diaphragms.

Nitrile silicone rubber differs from conventional silicone



Typical nitrile silicone

Even at "dry ice" temperatures nitrile silicone rubber remains flexible (top). Fluorinated hydrocarbon rubber (bottom) becomes stiff and brittle

Graphic demonstration of nitrile silicone rubber's resistance to JP-4 engine fuel at 350°F. O-ring of conventional rubber has swollen to nearly twice its original size. Nitrile silicone ring retains its size and shape

Silicone chemistry bonanza! nitrile silicone rubber

rubber in having certain hydrogens of hydrocarbon side chain replaced by a nitrile group. This replacement is repeated in a systematic way all down the polymer chain.

Resists Swelling

In testing the properties of this product, samples were exposed to three selected fuels at room temperature and degree of swelling was compared to that observed in a standard methyl silicone rubber similarly exposed. Nitrile rubber showed less swelling by a factor of 10.

Less striking but effective results were evidenced in tests in three types of oil for 70 hr at 300°F. Nitrile silicone rubber showed only a low degree of volume swell. Similar results were noted at even higher temperatures.

At "dry ice" temperatures, when even a fluorinated hydrocarbon rubber became stiff and brittle, nitrile rubber remained flexible.

Preparing nitrile silicone rubber proceeds as follows: A high-purity, nitrile-containing silicone is made from a simple silicone molecule by chlorination, a Grignard reaction, and polymerization. This pure nitrile intermediate is first converted to a fluid by hydrolysis and then to a very high molecular weight polymer. Long chain polymer is intimately mixed with a filler, like silica, and a vulcanizing agent such as benzoyl peroxide. It is then heated in a mold to produce a rubber. Other ingredients can be added, such as red pigment.

It is the use of correct type and amount of filler and vulcanizer which results in a material of optimum consistency for subsequent molding and extruding operations. This yields rubber of optimum properties.

(Nitrile silicone rubber is a development of Silicone Products Dept., General Electric Company, Waterford, N.Y.)

Check 2227 opposite last page.

...a highly reactive gas; a strong Lewis acid; a flame-speed accelerator with an extremely high heat of combustion – DIBORANE B_2H_6

3

Diborane, the simplest of boron hydrides, decomposes slowly at room temperature—and more rapidly at higher temperatures—to hydrogen and higher-molecular-weight boron hydrides. It is completely hydrolyzed by water—either neutral or acidified. Diborane burns in air with a green flame to give boric oxide and water (or boric acid).

Applications include uses as intermediate, reducing agent, catalyst and flame-speed accelerator. It can be stored at low temperatures and can be handled safely with suitable precautions. Write for Technical Bulletin C-020.

Phone: FOrest 4-1130 TWX: Perrysville, Pa. 117

GALLERY CHEMICAL COMPANY
PITTSBURGH 37, PENNSYLVANIA

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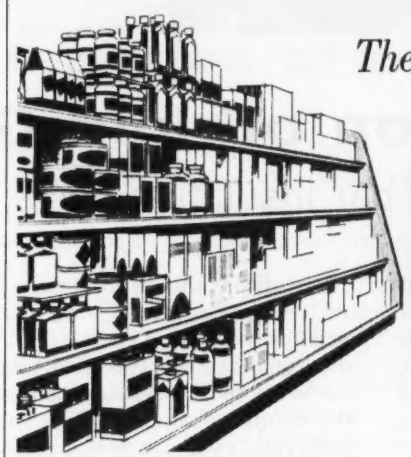


There's an ODRENE specifically designed to SELL your household product!*

ODRENES are a series of fragrances scientifically compounded to enhance household products—giving them sales-tested odor appeal.

They are available in a wide variety of odor types, each of which is extremely versatile—can be quickly and easily adapted to the specific needs of the product in which it is to be used.

You can select and apply the right ODRENE for your product with minimum trouble and expense. And you can be sure that its fragrance is one for which the public has expressed a preference!

ODRENES are products of Sindar's pioneering experience in aromatics. Ask us for samples and technical cooperation.

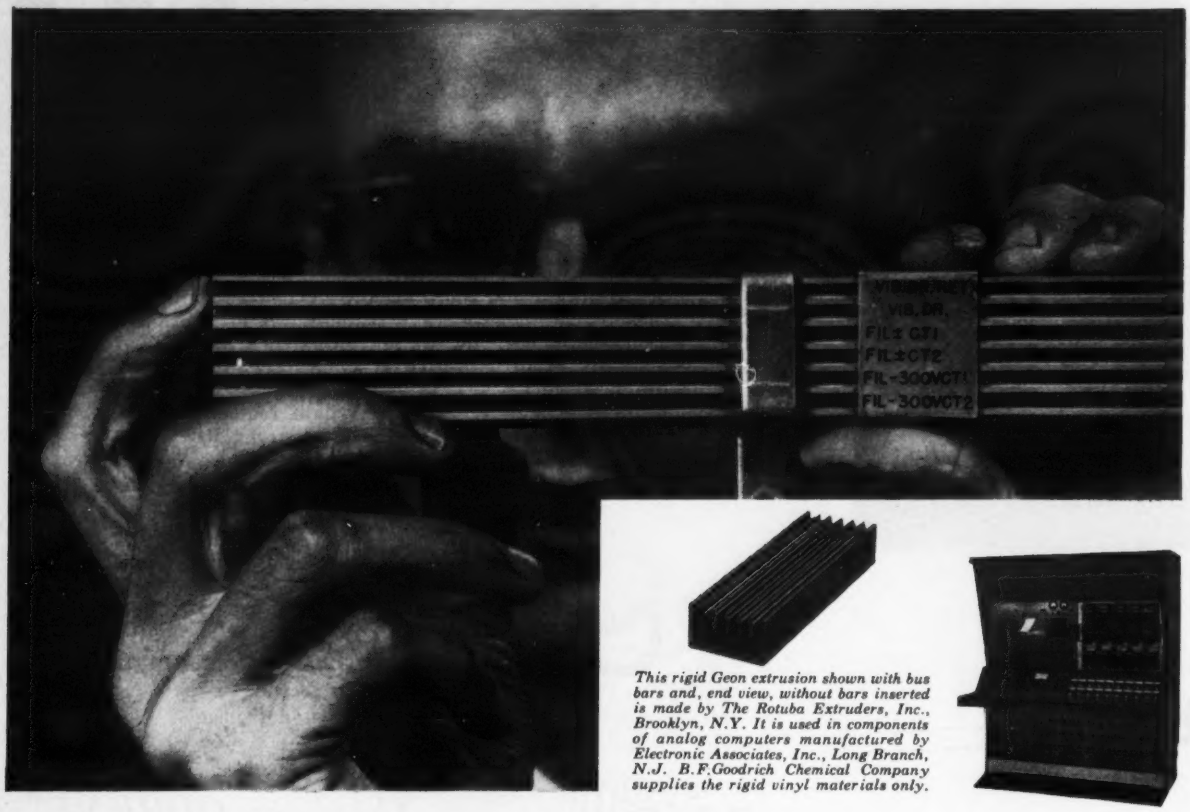
**Odrene is the registered trade-mark for Sindar's series of fragrant additives.*

SINDAR® Corporation
Industrial Aromatics and Chemicals
321 West 44th Street • New York 36, N. Y.

Check 2229 opposite last page

Another new development using

B.F.Goodrich Chemical *raw materials*



This rigid Geon extrusion shown with bus bars and, end view, without bars inserted is made by The Rotuba Extruders, Inc., Brooklyn, N.Y. It is used in components of analog computers manufactured by Electronic Associates, Inc., Long Branch, N.J. B.F.Goodrich Chemical Company supplies the rigid vinyl materials only.

Extrusion of rigid Geon

. . . cuts bus bar insulation costs, saves assembly time

This extrusion of Geon rigid vinyl material saves cost, time and space for electrical assemblies. It is used to retain and insulate six strip-type bus bars of varying voltages up to 600 volts DC. They can be placed closer together because of rigid Geon's high dielectric strength and high insulation value.

Rigid Geon brings material costs down, too, for this application. It also shortens assembly time and saves weight and space.

In addition, the use of extrusions made from Geon rigid vinyl material provides good chemical and abrasion resistance. If desired, they can be colored for coding purposes. It's another example of the way Geon rigid vinyl can be the key to a new or improved product or application. For information, write Dept. LJ-11, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

B.F.Goodrich Chemical Company
a division of The B.F.Goodrich Company

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GEON polyvinyl materials • HYCAR American rubber and latex
GOOD-RITE chemicals and plasticizers • HARMON colors

Check 2230 opposite last page

Just combine contents of twin pack for urethane foam

All necessary ingredients are pre-measured

Uses: Special packaging is designed to permit easy, routine preparation of urethane foam with a minimum of skill required.

Features: Material is supplied premixed in a two-part package. Processor need only combine the ingredients of two drums in a pre-determined ratio to produce a rigid non-friable foam. Maximum uniformity of foam cell structure and equal density of batches is insured because all the necessary ingredients are accurately pre-measured into the two drums.

Complete foaming takes place in three minutes

Description: Two types of foam are available in a twin pack. One is formulated to produce maximum dimensional stability when subjected to elevated temperatures, high humidity and total immersion in water at minimum density (PFR 500). It is suitable for continuous service at 250°F and intermittent service at 300°F.

Second product was developed to produce a minimum density foam for use as low-cost void fillers or in flotation applications (PFR 501).

(PFR 500 and 501 are products of Plastics & Coal Chemicals Div., Allied Chemical Corp., 40 Rector St., New York 6, N.Y.)

Check 2231 opposite last page.

Commercial quantities of vinyl stearate now available

Efficient plasticizer imparts higher flexibility

Uses: Vinyl stearate is used to copolymerize with such other monomers as vinyl acetate and vinyl chloride to impart permanent flexibility.

Features: Manufacturer is first to produce vinyl stearate in commercial quantities. Vinyl acetate copolymers containing 10 to 15% vinyl stearate are fully plasticized and display superior water and grease resistance.

Description: Product is a low-melting solid with a white, waxy appearance and faintly sweet odor. It is highly soluble in most hydrocarbon and chlorinated solvents, and moderately soluble in ketones and most of the vegetable oils.

Vinyl stearate, as shipped, contains no inhibitor and is stable under normal storage conditions.

(Vinyl stearate is available from Air Reduction Chemical Co., Div. of Air Reduction Co., Inc., 150 East 42nd Street, New York 17, N.Y.)

Check 2232 opposite last page.

Non-yellowing finish given by softener for cottons

Uses: Resin finishing of cottons, rayons requiring high-temperature curing or mechanical polishing or embossing operations.

Features: Softener has high resistance to yellowing at high temperatures. It is completely free of chlorine retention.

Description: Nonionic softener is available as a pure white paste. It produces desirable softness and lubrication and increases sewability characteristics of treated fabics.

(Softyne R is a product of Hart Products Corp., 1440 Broadway, New York 18, N. Y.)

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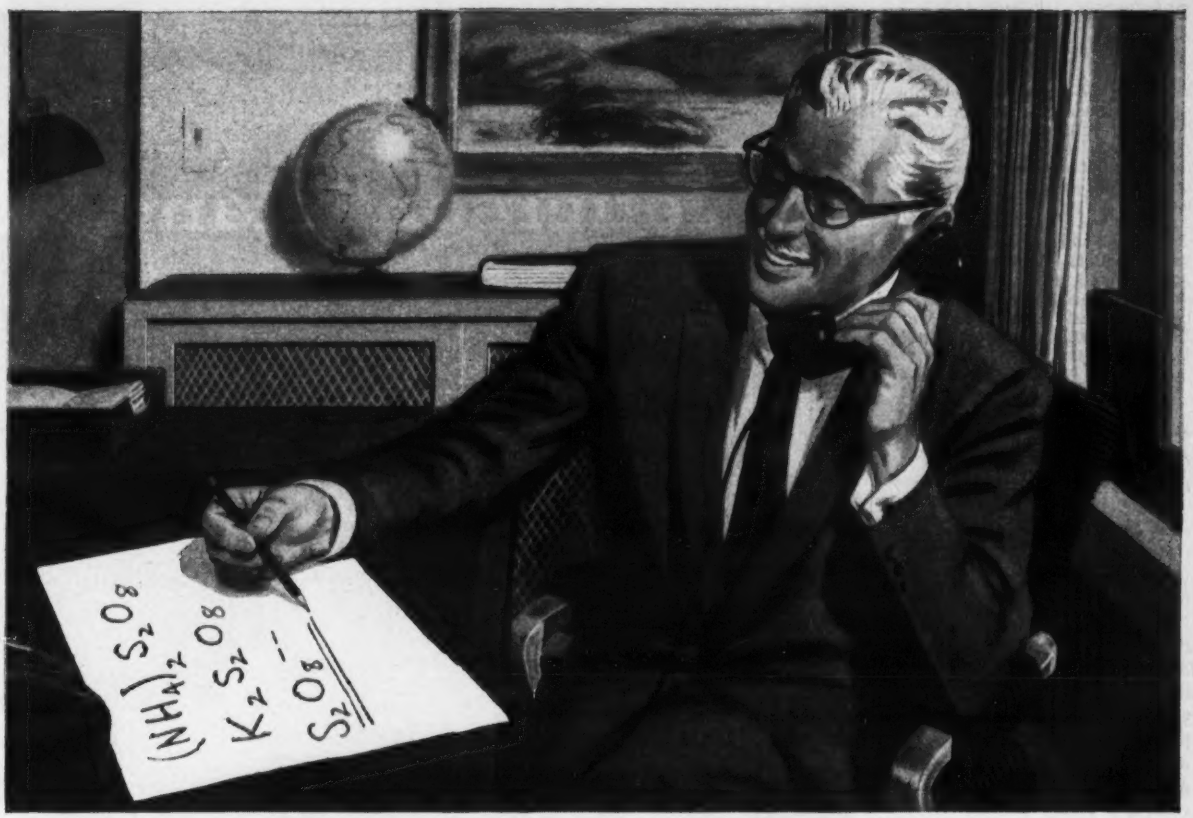

Where can you use the unique characteristics of persulfates?

All peroxygens carry active oxygen in their molecules, but the persulfates offer these special properties as well: Unusually high oxidation potential, good resistance to catalytic decomposition, and a reactive anion that gives reactions quite different from those of other peroxide compounds.

You'll find persulfates have particular values in processes involving emulsion polymerization of monomers and depolymerization of organic polymers. Persulfates excel in such applications as processing color films, etching printing plates, and modifying starches; and are of interest as reactive oxidizing agents for many other purposes.

Perhaps *your* processing techniques can be improved through the use of Becco Persulfates. A Becco field engineer will be glad to discuss this with you, at no obligation . . . drop us a line. At the same time, ask for your free copy of these booklets:

Nos. 34 and 68, "Uses of Persulfates"
No. 63, "Action of Persulfates on 1, 2-Glycols"
No. 90, "Etching of Printed Circuits with Ammonium Persulfate"

BECCO CHEMICAL DIVISION
Food Machinery and Chemical Corporation
Station B, Buffalo 7, New York

Progress in Peroxygens ® **BECCO**

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FMC CHEMICALS INCLUDE: BECCO Peroxygen Chemicals • WESTVACO Phosphates, Barium and Magnesium Chemicals • WESTVACO Alkalis, Chlorinated Chemicals and Carbon Bisulfide • NIAGARA Insecticides, Fungicides and Industrial Sulphur • OHIO-APEX Plasticizers and Chemicals • FAIRFIELD Pesticide Compounds and Organic Chemicals

Check 2234 opposite last page

Sodium and potassium borohydrides properties, reactions, and handling requirements are covered in 34-page manual. Included in manual are detailed descriptions of reactions in aqueous and non-aqueous solvents. Technical data compiled from the most significant works published to date are presented in 13 convenient tables. Sodium and Potassium Borohydrides Manual may be obtained by letterhead request to Metal Hydrides Inc., Congress Street, Beverly, Mass.

A dry, free-flowing media component now available

Easily handled and weighed

Uses: A media component for fermentation industry.

Features: Dry, easily handled material is free flowing.

Description: Amber BYF is water-soluble fraction of autolyzed brewers yeast. It contains high-quality, water-soluble peptones, peptides and amino acids, plus all the B complex vitamins and growth factors. Total nitrogen is 9.0% of which more than 35% is amino nitrogen. Product is priced at 25c/lb in car load lots and 35c/lb in ton lots.

(Amber BYF is product of Amber Laboratories, Inc., 3456 N. Buffum St., Milwaukee 12, Wisconsin.)

Check 2235 opposite last page.

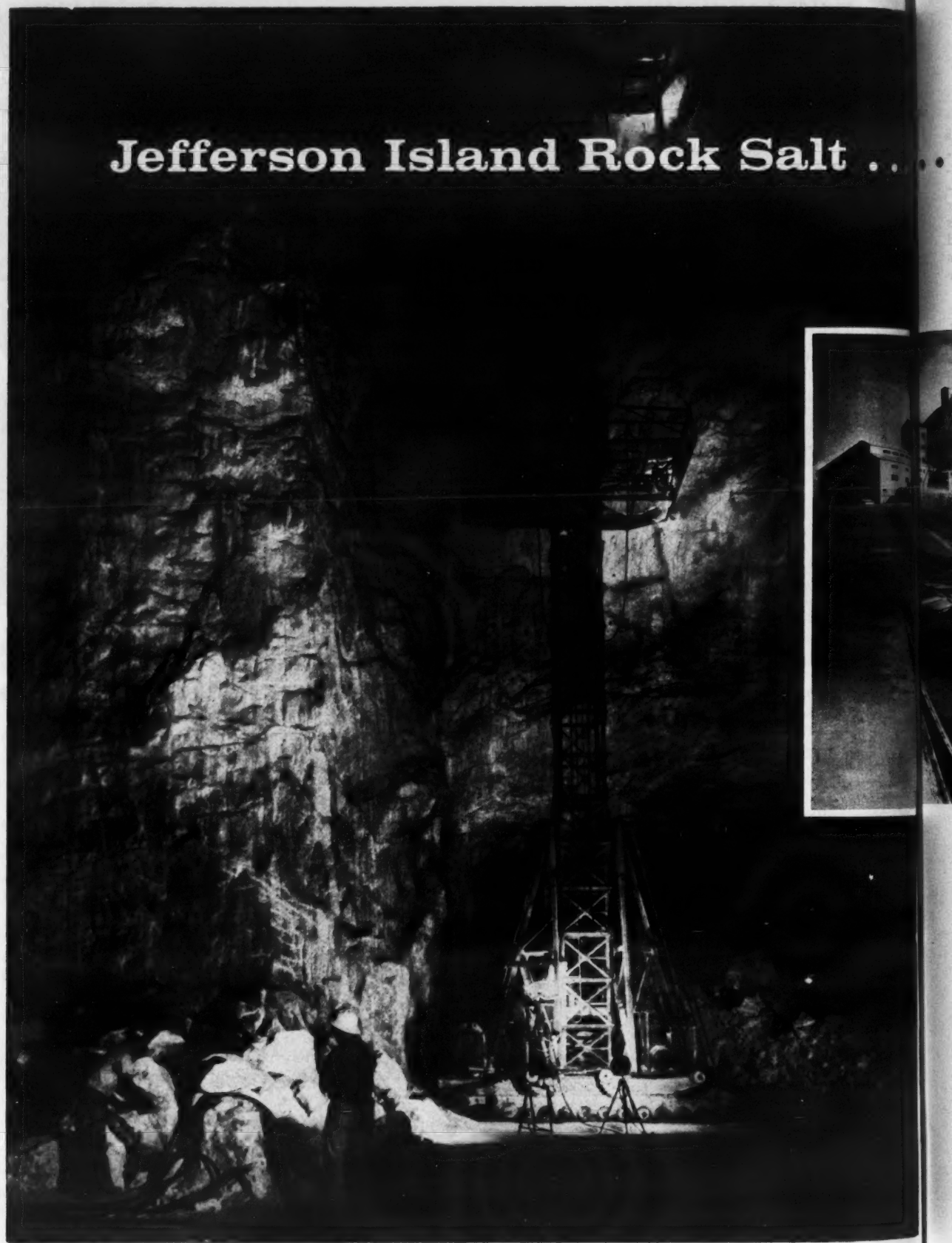
New end uses expected for polyolefin resins being introduced

Branched polyethylene chain increases load bearing

Uses: Polyolefin resin series is expected to find use in manufacture of monofilaments for such products as wire covering, blown containers, paper coating, film and pipe.

Features: Polymers have been designed for sustained stress service and load bearing. Improved stress resistance is created by adding branches of the proper type at proper intervals to the long straight molecular structure of rigid polyethylene.

Description: Fortiflex polyolefin resins series provides



. . . so pure that every chemical manufacturer benefits

The picture above shows rock salt being loaded into barges at Jefferson Island, La., for movement through the Inland Waterways. Many chlorine, synthetic rubber and other heavy industrial plants use barging to effect both economy and service.

For many years, rock salt from Jefferson Island has made possible many economies in chemical processing.

Mined in Louisiana from one of the world's purest deposits, this rock salt results in a consistently better end product—without the costly side reactions of impurities found in less pure salt. The big story is up to 99% purity at the source.

TWO GREAT NAMES MERGE AS ONE

Recently, the Jefferson Island Salt Co., merged with Diamond Crystal, a company known for more than 70 years as a quality producer of flake and granular salt. For example, Diamond Crystal is the leading supplier of salt to high quality food processors.

Jefferson Island Division, on the other hand, is the largest supplier of industrial rock salt by barge on the inland waterways. In fact, they pioneered the first complete ocean-going barge movement of salt to Gulf Coast chemical plants.

INHERENT PURITY—KEY TO COST SAVINGS

The inherent purity in Diamond Crystal Salt is a major factor in *all* industries.

In addition, maximum customer economies and service can result from using Diamond Crystal's complete facilities.

For immediate service and consultation on your salt problem, call the nearest Sales Office or write: Jefferson Island Salt Div., Diamond Crystal Salt Co., St. Clair, Michigan.

DIAMOND CRYSTAL SALT

SALES OFFICES: CHARLOTTE, ATLANTA, NEW ORLEANS, LOUISVILLE, BOSTON, NEW YORK, AKRON, DETROIT, CHICAGO, MINNEAPOLIS

PLANTS: AKRON, OHIO . . JEFFERSON ISLAND, LA. . . . ST. CLAIR, MICH.

Check 2236 opposite last page

group of resins with a range of properties not available in other large-volume plastic materials. Commercial quantities of first polymer of the group, whose principal application will be for monofilaments, are now being produced. Additional polymers for other uses will be in production soon. Each member will be tailor-made to have the optimum balance of properties for end use intended.

(Fortiflex resins are product of Celanese Corporation of America, 180 Madison Ave., New York 16, N.Y.)

Check 2237 opposite last page.

Obtain hard, tough film using copolymer for baking finishes

Butadiene-styrene product for dips or sprays

Uses: Formulation of metal primers and gloss finish coats, for both dip and spray application.

Features: By means of metallic catalysts and elevated temperatures, polymer is converted from a soft, slightly tacky, solvent-susceptible material to a dry, tough, solvent-resistant film. It is alkali resistant and has excellent adhesion to most substrates.

Description: Polyco XP 24-97 is a copolymer of butadiene and styrene specially made for use in baking finishes on metal surfaces.

(Polyco XP 24-97 is product of Polyco-Monomer Department, Borden Chemical Co., 350 Madison Ave., New York 17, New York.)

Check 2238 opposite last page.

Hydrazine-derived blowing agent is covered in two technical bulletins. One bulletin (PKB-1) covers use of material in natural and synthetic rubber. The other (PKB-2) outlines application of the agent in expansion of calendared sheeting, extruded stocks, and plastisol compounds based on polyvinyl chloride resins. Buls PKB-1 and PKB-2 — National Polychemicals, Inc., Wilmington, Massachusetts.

Check 2239 opposite last page.

1958 ☐ Expect new successes in paints, papermaking, textiles, adhesives and chemical specialties. Trials are over. Volume is growing. Proof: Bulk buyers now account for 56% of National's sales. Their number has more than doubled since 1957.

1959 ☐ Expect exciting new polymers from new concepts in polymerization technology. Higher toughness, water resistance and pigment binding power are indicated by evaluations and scale-up studies now under way.

1960 ☐ Expect new directions and properties for industries already using vinyls—and elsewhere as well. Their source: Today's research momentum on new catalysts, new monomers, block polymers, graft polymers and new emulsifying systems.

Whatever your interest in vinyl emulsions, it's easy to put the unmatched know-how and nation-wide service of a pioneer producer to use. National's specialists are located in the cities listed below. For fast service, contact the one nearest you.

RESIN DIVISION
National
STARCH PRODUCTS INC.

National Starch Products Inc., 750 Third Avenue, New York 17, N. Y. • Plainfield, N. J. • Chicago • Los Angeles • San Francisco • Cleveland St. Louis • Atlanta • Miami • Canada: Toronto • Montreal • Vancouver • Mexico City: Polimeros, S. A., Apartado 28504, Mexico 17, D. F.

Check 2240 opposite last page

Highly soluble sorbate increases use pattern of anti-mycotic

Commercial availability of a highly soluble form of potassium sorbate has been announced. Product is a selective non-toxic inhibitor for molds and yeasts. It permits preparation of a concentrated stock solution which makes possible many new uses for this anti-mycotic agent.

Up to 40% solutions can be prepared by simply dissolving white crystalline powder in water. This overcomes problem of water solubility of sorbic acid.

(Sorbistat-K is a product of Chas. Pfizer & Co., Inc., 800 Second Ave., New York 17, New York.)

Check 2241 opposite last page.

Effective foam killing offered by silicone anti-foams

Forms available for aqueous and non-aqueous systems

Uses: Controlling foam in manufacturing processes or loading of tank cars and other equipment; or as components in formulated materials such as synthetic resins, cleaners, paints, or paper.

Features: Antifoams are fast acting and highly effective. Only small quantities are required: often as little as 10 to 200 ppm.

Description: Product is available in two forms. One is a 100% solid solution (SAG 47) which can be used at full strength, or as a solvent solution, or blended with other materials. Second is an emulsion containing 10% silicone solids by weight (SAG 470). It is ready for use or can be further diluted if desired. Antifoams are chemically inert and resist oxidation over long periods. Toxicity is extremely low.

(SAG Antifoams 47 and 470 are products of Silicones Div., Union Carbide Corp., 30 East 42nd St., New York 17, N.Y.)

Check 2242 opposite last page.

THAT'S INTERESTING

Flies coop

A sparrow nest containing five young 'uns was within two ft of the engines at North American Aviation's Small Engine Test Facility. The mother bird stood by valiantly — up to a certain point. Each time the 20-second siren warned of an impending firing, mama flew the coop and stayed out of range until all the tumult died down. Then she returned to her thoroughly shook up offspring. It's a wise old sparrow . . . (*Valley Skywriter*, North American Aviation, Inc.)

Driver tags

Anodized aluminum tags, size of a calling card, are now issued to South Carolina drivers in place of conventional licenses. Info is put on aluminum by photo process, and tags are punched to fit key ring. (*The Alcoa News*, Aluminum Co. of America)

For more information on product at right, specify 2243 see information request blank opposite last page.

ELIMINATE THE SQUEEZE OF RISING RAW MATERIAL COSTS

AND SHRINKING PROFITS

n-PROPYL ACETATE

saves

UP TO 10¢ A GALLON

if you are now using a combination of ethyl and butyl acetate . . . you also gain the convenience of using one solvent in place of two, freeing a storage tank for other purposes.

and

You pick up important cost savings by using Celanese n-Propyl Acetate in place of:

mixtures of isopropyl acetate and n-butyl acetate
methyl isobutyl ketone
isobutyl acetate

NATIONWIDE SERVICE
as and when you need it . . .

Use CARDOX bulk liquid CO_2 SYSTEM

The original bulk CO_2 system to simplify and streamline carbon dioxide supply and use . . .

- **No capital investment, equipment rental or upkeep cost to you***
- **Highest purity, moisture-free carbon dioxide**
- **Delivered promptly by the TON in ANY QUANTITY direct to your storage tank from sealed tank car or truck**
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- **Simple, dependable, economical**

To get the *most* from the bulk liquid CO_2 handling system, get CARDOX. Hundreds of plants now using CARDOX Bulk Liquid CO_2 will verify this statement! WRITE FOR FULL PARTICULARS TODAY.

* *Cardox* supplies the CARDOX Low Pressure Storage Tank, installs the System and maintains it for you. Based upon reasonable consumption requirements, all you pay for is the CARDOX CO_2 you *actually use*, at the low rates established in your contract. Prompt CO_2 delivery *always* from principal cities.

CARDOX DRY ICE
is now available in most principal cities

DRY ICE DEPOTS AT:
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MANUFACTURERS OF: Carbon Dioxide Fire Extinguishing Systems • Foam Fire Equipment • Liquid Carbon Dioxide • Dry Ice • Airdox and Cardox Mining Methods • Auger Miners • Augers and Bits • Central Compression Systems for Air, Helium, etc.

Check 2244 opposite last page

"Organic Ozone Reactions and Techniques", a theoretical monograph, is divided into nine sections, including a discussion of mechanisms and consideration of various linkages, functional groups and nucleophilic centers attacked by ozone. Published by The Welsbach Corp., 1500 Walnut Street, Philadelphia 2, Pa.

Check 2245 opposite last page.

Vinyl-modified gums used in formulating low-temp compounds

Need shorter curing cycles

Uses: Gums are designed for use in formulation of class 500 or extreme low-temperature-service silicone rubber compounds.

Features: Because gums are vinyl-modified, ultimate physical properties of compounds based on them can be obtained with curing cycles shorter than normally required. Excellent compression-set properties can be realized without use of toxic additives.

Description: One compound, SE-54, is a particularly low-shrinkage material. Its companion, SE-53, is a standard shrinkage polymer. Compounds formulated from these two gums give good performance over −150 to 500°F temperature range.

(Silicone gums SE-54 and SE-53 are products of Silicone Products Department, General Electric Co., Waterford, New York.)

Check 2246 opposite last page.

Needs only contact to form durable bond

Adhesive has resistance to water, chemicals

Uses: Adhesive was primarily developed for joining metals to metals. It also has shown superior results in bonding glass, plastics, wood, and masonry. Reinforced with glass fibrous cloth, it is an efficient medium for the repair of tanks and vessels.

Features: Applied in a thin

layer, high-strength adhesive requires only contact pressure for a durable bond that will not delaminate even under heavy duty. It has resistance to water, chemicals, and solvents.

Description: Two-component system, resin 532, is an epoxy adhesive. It is effective at high as well as moderate temperatures. For general requirements an overnight cure at room temperature can be used, or a one-hour cure at 200°F.

(Maraset resin 532 is a product of Marblette Corp., 37-31 Thirtieth St., Long Island City 1, N.Y.)

Check 2247 opposite last page.

Extends emulsion life two to four times in metal working

Bacterial contamination reduced safely

Uses: Reducing bacterial contamination of soluble oil emulsions, particularly for the metal working industry.

Features: Inhibitor is effective in all standard-duty soluble oil emulsions and synthetic coolants. Tests have shown that it will extend life of emulsions two to four times.

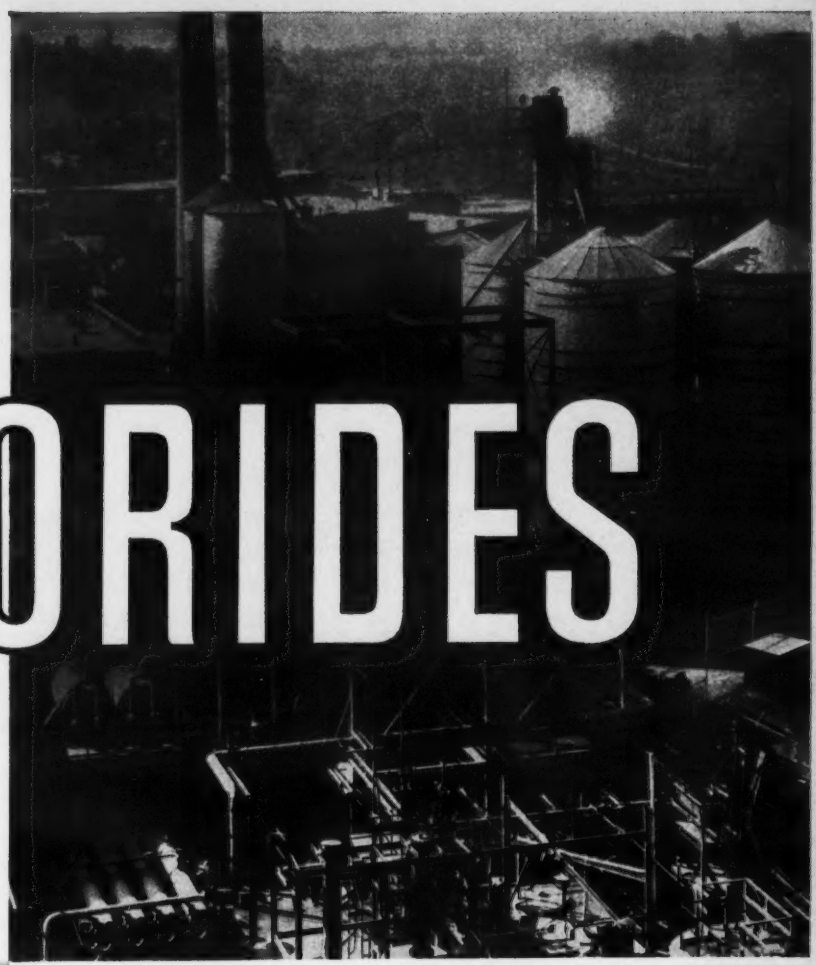
Description: Product is a stable combination of thimerosal and sodium-o-phenylphenate. It is supplied as a brown aqueous solution that is readily dispersible. Recommended use is 1 ounce in 4 gallons of fresh emulsion. Product acts as a bacterial inhibitor and is marketed as Elcide 75™.

(Elcide 75™ is a product of Eli Lilly & Co., 740 S. Alabama St., Indianapolis 6, Ind.)

Check 2248 opposite last page.

Diester fluid base for synthetic lubricants is subject of 10-page bulletin which lists specifications and characteristics. Suggested starting formulas for synthetic lubricating fluids and greases are included in Tech Bul 411 — Emery Industries, Inc., Dept. 5, Carew Tower, Cincinnati 2, Ohio.

Check 2249 opposite last page.



HARSHAW

FLUORIDES

manufactured in one of the largest facilities in the world

Unloading mineral fluospar which comes to us from various parts of the world.

Write for your free copy of M.C.A. Chemical Safety Data Sheet SD-25 on properties and essential information about HYDROFLUORIC ACID Anhydrous and Aqueous.

BORON TRIFLUORIDE
HYDROFLUORIC ACID
ANHYDROUS...AQUEOUS

and a long list of other production-controlled high-quality fluorides

Ammonium Bifluoride
Ammonium Fluoborate
Antimony Trifluoride Sublimed
Barium Fluoride
Bismuth Fluoride
Boron Trifluoride
Boron Trifluoride Complexes
Cadmium Fluoborate
Chromium Fluoride
Copper Fluoborate
Fluoboric Acid
Fluorine Cells
Fluorinating Agents
Frosting Mixtures
Hydrofluoric Acid Anhydrous
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Nickel Fluoborate
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Sodium Fluoborate
Tin Fluoborate
Zinc Fluoborate
Zinc Fluoride

If required you are invited to draw on the knowledge and experience of our staff of technical specialists on fluorides.

The Harshaw Chemical Company

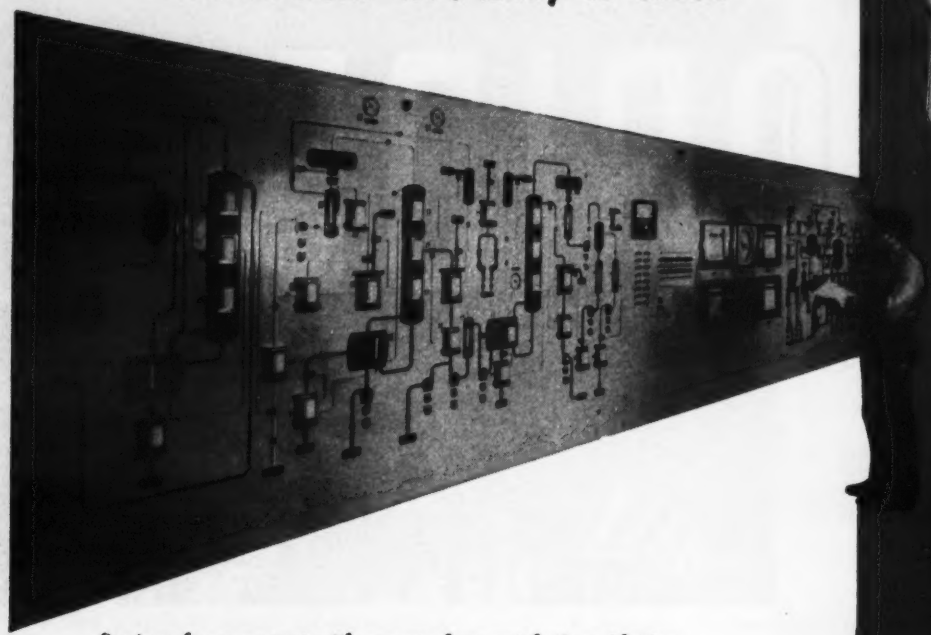
1945 EAST 97TH STREET • CLEVELAND 6, OHIO

CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES
HASTINGS-ON-HUDSON, N. Y. • PHILADELPHIA • PITTSBURGH

Check 2250 opposite last page

Direct Continuous Process makes NATIONAL® MALEIC ANHYDRIDE TABLETS

Economical and Easy-to-Use!



Savings for you start with our modern catalytic-oxidation process in the world's largest Maleic Anhydride-Fumaric Acid plant. All basic materials come from within the Allied Chemical group. Our exclusive catalytic-oxidation process is direct, continuous, automatically-controlled, uniform.

We tablet National Maleic Anhydride under controlled-pressure into a dense, smooth, "cornerless contour" form that shows minimum degradation from our plant to your kettle.

Screen analysis of leading brands after a 1,000-mile truck haul shows drums of National Maleic Anhydride Tablets have 75-90% fewer fines.

And for extra savings, you get mixed car or truckload rates on combination orders for any of the resin-chemicals listed from plant or nearby branch warehouse stocks.

Start saving now by getting our quotation on your needs.

NATIONAL ANILINE DIVISION
40 RECTOR STREET, NEW YORK 6, N Y
Atlanta Boston Charlotte Chattanooga Chicago Greensboro Los Angeles
Philadelphia Portland, Ore. Providence San Francisco Toronto

Allied Chemical

Check 2251 opposite last page

Low odor level marks this amine catalyst for urethanes

A colorless, stable-liquid urethane catalyst is now commercially available. Product, N,N,N′,N′-tetramethyl-1,3-butanediamine, has an exceptionally low odor level and yields soft, pliable foams. It is completely soluble in water and common organic solvents. High reactivity permits faster curing.

(Tetramethyl butanediamine is a product of Union Carbide Chemicals Company, Division of Union Carbide Corp., 30 East 42nd Street, New York 17, New York.)

Check 2252 opposite last page.

Dual spray application possible with this polyester resin

Low thixotropic viscosity promotes fiber wetting

Uses: Product is a polyester resin particularly suitable for laminating.

Features: In addition to standard polyester properties, resin is particularly suited for application in dual-spray method. Low viscosity and slightly thixotropic characteristics promote rapid wetting of glass fibers and freedom from sagging on surfaces.

Description: Laminac 4106 is a rigid-type polyester with a specific gravity of 1.1. Viscosity (Brookfield Model RVF, spindle #1, 10 rpm) is 5 poises at 77°F. Best results are obtained by promoting and catalyzing the resin to gel in 20 to 25 minutes.

(Laminac polyester resin 4106 is a product of American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y.)

Check 2253 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Pilot plant quantities of three chlorinated xylenes offered

One derivative of p-xylene and two of m-xylene are now being offered on a pilot plant scale by manufacturer. Products are terephthaloyl chloride, isophthaloyl chloride, and γ, γ'-hexachloro-m-xylene. All three of these chemicals represent interesting possibilities as intermediates for a variety of end-products.

Both terephthaloyl chloride and isophthaloyl chloride can be reduced to dialdehydes and dibasic acids and can be esterified easily with alcohols. These acid chlorides will undergo the Friedel-Crafts reaction, will react with organic sodium compounds, with Grignard reagents, and can be chlorinated.

(Terephthaloyl chloride, isophthaloyl chloride and γ, γ-hexachloro-m-xylene are available from Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.)

Check 2254 opposite last page.

No protection needed for nickel catalyst that's stabilized

For slurry hydrogenation of organic compounds

Uses: Catalyst is expected to have broad application in slurry hydrogenation of organic compounds such as reducing nitriles to amines and converting aldehydes to alcohols.

Features: Catalyst is nonpyrophoric so can be supplied without any type of protective medium. It is safer, more easily handled than existing types.

Description: Designated G-49, product is a reduced, stabilized nickel catalyst. It contains no organic compounds or other protective medium. This will also reduce shipping weight by 50 to 60%.

(Catalyst G-49 is a product of Chemical Products Div., Chemetron Corp., 840 N. Michigan Ave., Chicago, Ill.)

Check 2255 opposite last page.

All 3 performance benefits you want most from your air compressor lubricant...

LOW UPKEEP • PEAK LUBRICATION • FIRESAFETY AT LOWEST COST WITH PYDRAUL AC LUBRICANT

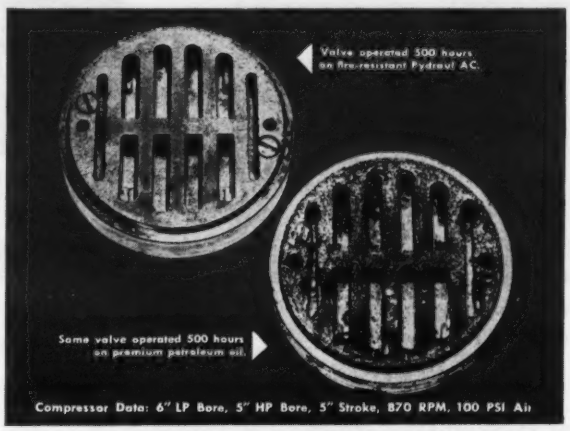
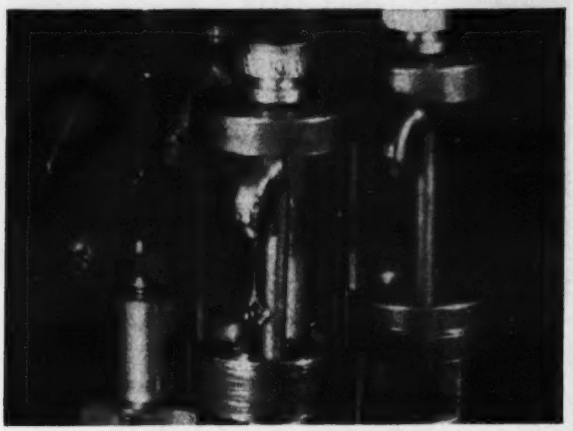
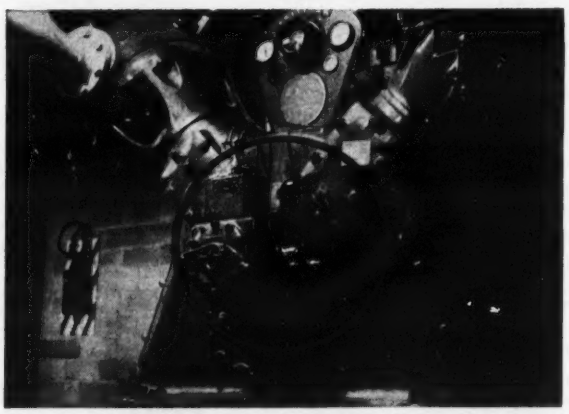


Photo proof: Pydraul AC runs cleaner—can substantially cut your air compressor upkeep costs because it reduces build-up of carbon and other deposits—extends operating time between overhauls. Side-by-side photos (above) of an exhaust valve—operated in the same industrial air compressor with only the lubricant changed—shows how Pydraul AC keeps air compressor systems freer from harmful and dangerous deposits than a premium petroleum oil. Lower maintenance costs alone usually justify your use of Pydraul AC.



Pydraul AC lubricates like premium-grade oil—good antiwear qualities and noncorrosive features give your equipment longer life. And Pydraul AC is the one lubricant for virtually every air compressor you own—has demonstrated its excellent lubricating efficiency in hundreds of compressors of all types and sizes produced by all of the major compressor manufacturers—has operated without trouble or replacement for periods up to 5 years. Now, Pydraul AC is effectively lubricating air compressors operating at over 4500 psi. Many compressors have operated continually with exhaust air temperatures of 340° F.



Firesafe Pydraul AC gives 2-way protection in this danger zone. Residue from lubricants deposits inside compressor cylinders, valves and piping throughout the system—glows hot and flakes off—can unpredictably ignite flammable vapors from hot petroleum-based lubricants causing fire...explosion! Monsanto's synthetic lubricant, Pydraul AC, essentially eliminates this basic cause of most air compressor fires and explosions in 2 ways: it lessens carbon deposits and oxidation residues, and it is a *fire-resistant* lubricant.

ONLY PYDRAUL AC gives you *at lowest cost* all 3 performance benefits you want most from your air compressor lubricant: low upkeep, firesafety, peak lubrication. Write Monsanto for *your* free trial sample.

Monsanto

PYDRAUL—Monsanto T.M., Reg. U.S. Pat. Off.

SEND COUPON FOR MORE DETAILS

Monsanto Chemical Company
Organic Chemicals Division
Dept. CP-3, St. Louis 24, Mo.

Please send me the new 16-page booklet on fire-resistant Pydraul AC lubricant for air compressors.

Name.....

Company.....

Address.....

City.....*Zone*.....*State*.....

Check 2256 opposite last page

Suppliers to the industry

Tamms

SILICA — Amorphous, Crystalline and Diatomaceous in proper grind

MAGNESIUM SILICATE — New York state talc 325 mesh and micronized grades

WHITING — Water ground, dry ground, 325 mesh and micronized grinds

DIATOMACEOUS EARTH — Excellent flatting agent giving low angular sheen

CLAYS — Domestic and imported grades

MAGNESIUM CARBONATE — High bulking and re-inforcing pigment

TAMMS INDUSTRIES CO.
RM 25 228 N. LA SALLE ST. CHICAGO 1, ILL.

Check 2257 opposite last page

"NOSEY" says:

MANY are the odd and interesting uses of odorants and deodorants in today's busy world. . . . For the bad-smelling, fabricated skin of a 100-foot dummy whale, a famous museum requires a suitable deodorant; a cherry odor incorporated in modeling clay makes this product more appealing for the kiddie market; plastic display fruits are made more realistic with lacquer coatings, aromatized to smell like natural orange, lemon, pineapple and strawberry; cardboard liners and dividers for packing baked goods and confections are impregnated with cake and chocolate aromas. These typify the problems being solved each day by FRITZSCHE'S Industrial Odorant Division. Why not write them about **your** odor problem?

FRITZSCHE Brothers, Inc.

Est. 1871

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES and *STOCKS: Atlanta, Ga., Boston, Mass., *Chicago, Ill., Cincinnati, Ohio, Greensboro, N. C., *Los Angeles, Cal., Philadelphia, Pa., San Francisco, Cal., St. Louis, Mo., Montreal and *Toronto, Canada; *Mexico, D. F. and *Buenos Aires, Argentina. FACTORIES: Clifton, N. J. and Buenos Aires, Argentina.

Check 2258 opposite last page

CHEMICAL MATERIALS

Hafnium-free zirconium oxide and chloride in tonnage quantities

Now available for nuclear and research applications in tonnage quantities are high-purity, hafnium-free zirconium oxide and tetrachloride. Marketing step makes available extremely pure products for conversion by chemical manufacturers into a wide variety of hafnium-free zirconium compounds for laboratory research and industrial applications.

(Hafnium-free zirconium oxide and chloride are available from Columbia-National Corp., 70 Memorial Drive, Cambridge 42, Mass.)

Check 2259 opposite last page.

High activity, strength and porosity combined in activated carbon

Uses: As a catalyst support material or other applications requiring activated carbon.

Features: Material combines high activity with strength and porosity. It has a hardness of 98.9 compared to 85-95 for standard grades of activated carbon. Water pickup is 89.5%.

Description: Activated carbon, grade CXC 4/6, is manufactured from a specially selected petroleum derivative. It is in the form of 3/16-inch diameter pellets and has a bulk density of 0.45 grams/milliliter.

(Grade CXC 4/6 activated carbon is product of National Carbon Company div. of Union Carbide Corp., 30 East 42nd St., New York 17, N.Y.)

Check 2260 opposite last page.

High-pressure acetylene derivatives, properties and uses, are outlined in six-page bulletin which includes structures and physical forms of 11 high-pressure derivatives offered in commercial quantities. "High-pressure Acetylene Derivatives"—Antara Chemicals, a sales div. of General Aniline & Film Corporation, 435 Hudson St., New York 14, N.Y.

Check 2261 opposite last page.

CALCIUM CARBONATE

1. WET GROUND AND CENTRIFUGALLY CLASSIFIED — TREATED AND UNTREATED
2. DRY GROUND AND AIR FLOATED — BOTH RAYMOND AND TUBE MILL PRODUCTS
3. CRUSHED AND SCREENED — ALL SIZES

For full information and samples, contact

CPD CALCIUM PRODUCTS DIVISION

THE GEORGIA MARBLE CO. / TATE, GA.

Check 2262 opposite last page

HOW OXY-CATALYST SYSTEMS STOP INDUSTRIAL AIR POLLUTION— RECOVER WASTE HEAT

New brochure gives facts and figures on typical installations— send for your free copy now!

Oxy-Catalyst Systems for air pollution control and waste heat recovery are one of the most important and most effective solutions to these problems ever developed. Engineered to your individual requirements, they can clean up close to 100% of combustible pollutants and odors. They can also recover the waste heat in process exhaust gases; and they can often do both at once.

This new brochure tells how Oxy-Catalyst installations have stopped air pollution—often at an actual saving—in a wide range of industries. If air pollution is a problem in *your* operations, write for your free copy now.

OXY-CATALYST, INC. WAYNE 7, PA., U.S.A.

Catalysts for fume and odor elimination, air pollution control, and waste heat recovery

Please send me your new brochure on Oxy-Catalyst Systems for air pollution control and waste heat recovery.

Name_____

Firm_____

Street_____

City_____ Zone_____ State_____

Check 2263 opposite last page

A key man in the Oronite sales and marketing picture is N. E. Hathaway, vice president of marketing, who is shown here discussing the sales prospects for one of Oronite's many petrochemicals with Mr. Hughes

Although not a smooth and easy road, experience of Oronite Chemical Company — whose rate of growth in export business has averaged 44% over the past 10 years, with 22% of present total volume going abroad — shows that . . .

Foreign Trade Offers Opportunity For Petrochemical Producer

T. G. HUGHES, President
Oronite Chemical Company
and California Chemical International, Inc.

Mr. Hughes discusses South American sales prospects with G. M. Marino, sales manager for Latin America and Asia

Thomas Gerald (Jerry) Hughes is a highly energetic, personable executive. While an industrious worker who commands respect wherever he goes, he is an informal, free-wheeling sort of guy who has a sense of humor and won't stand on ceremony. He likes to be called "Jerry" by his business associates. Typifying the western executive, he brings a touch of informality to the organization. He places great stress on individual initiative.

Jerry Hughes has been associated with the petroleum and petrochemical field for more than 30 years with Standard Oil Company of California. When Standard formed Oronite Chemical Company in 1943 to handle its growing petrochemical business, Mr. Hughes became a director of the new company. After serving in other executive capacities with Oronite, he was elected president in 1950. He is also president of California Chemical International, Inc., which was formed early this year to handle the overseas marketing of Oronite products.

Mr. Hughes is a director of three other Standard of California subsidiaries — California Chemical Company, California Research Corporation and California Spray Chemical Corporation. He is also a director of four European companies in which Oronite has an interest. These include two French firms, Petrosynthese and Orogil, and two British companies, Grange Chemicals Limited and Orobis Limited.

ONE of the most interesting aspects of the chemical industry's tremendous postwar growth has been the rapid development of overseas markets. In Western Europe, Latin America, the Far East — practically every area of the free world — there is a steadily increasing demand for basic chemicals, based in large part on a rising standard of living.

There are occasional soft spots in the export market, of course. The overall picture, however, is one of steady expansion and increased opportunities for U.S. chemical and petrochemical producers. Naturally enough, there is also vigorous competition. More and more companies are entering foreign markets, either by exporting their U.S.-manufactured products, establishing subsidiary plants overseas, or both.

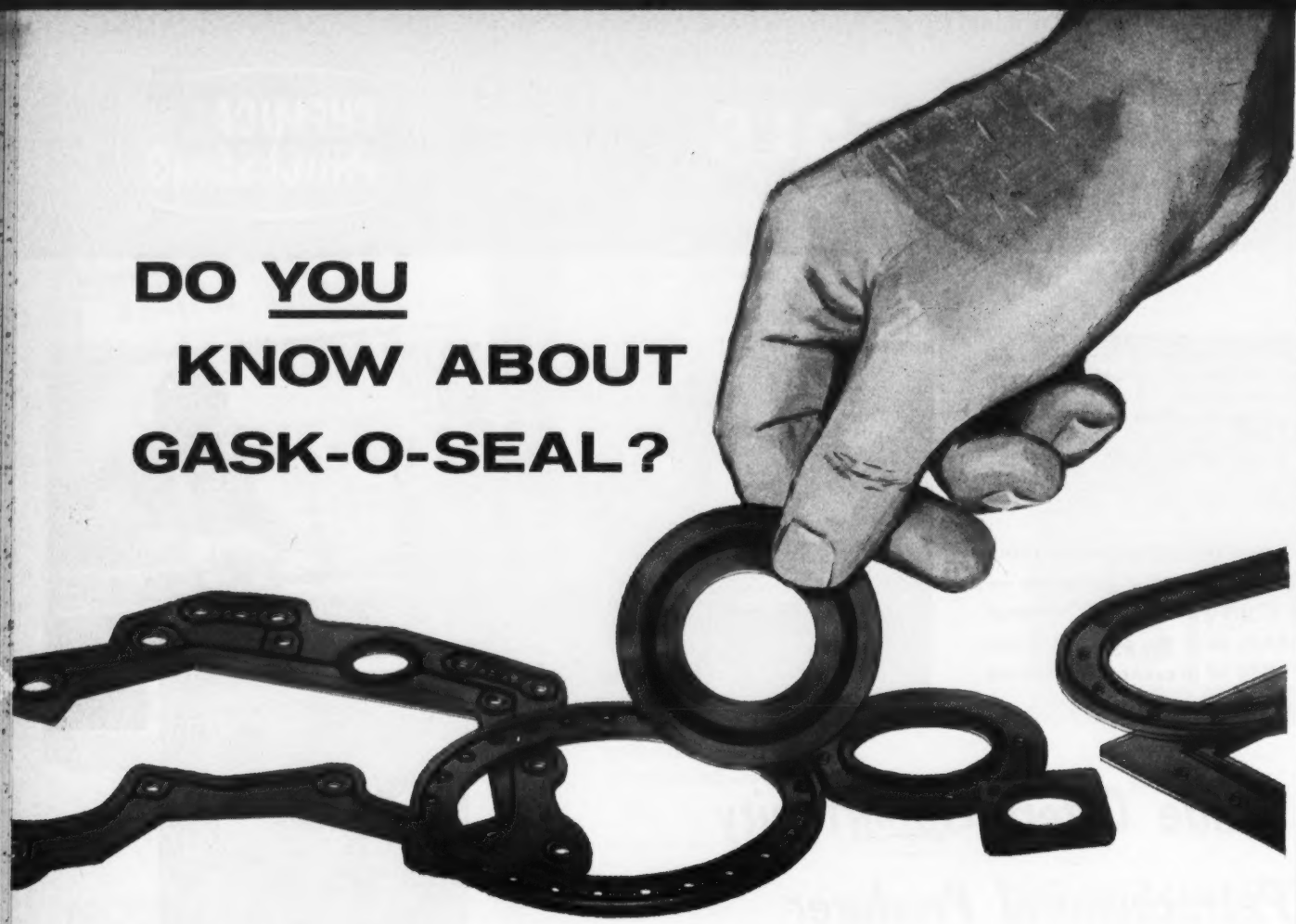
Even more remarkable than the magnitude of this growth has been the speed with which it has been accomplished. Our own company, for example, has been in existence only 15 years. Yet today Oronite Chemical, in addition to its substantial domestic business, sells more than 30 different petrochemical products in no less than 55 foreign countries. The company also has an interest in four major overseas plants, two in France and two in the United Kingdom.

New Company Formed

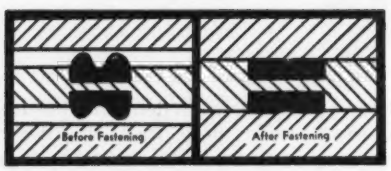
As a further indication of the growing importance of Oronite's export sales, a new company — California Chemical International, Inc. — was created early this year to handle Oronite's overseas marketing program. Like its sister company, Oronite, the new

To page 89

DO YOU KNOW ABOUT GASK-O-SEAL?



The static seal that can not blow out!



The above diagram is "typical" only. Gask-O-Seals are also made with one-side seals.

If you do not know about Gask-O-Seals look at these facts:

- Gask-O-Seals will seal practically any processable fluid . . .
- Gask-O-Seals can be re-used . . .
- Gask-O-Seals will seal at low or high pressures, vacuum or positive . . .
- Gask-O-Seals are available as standards and as specials in almost any configuration or to meet special requirements.

They are recommended for flanges, gear boxes, transfer cases . . . *any* place where truly efficient static seals are needed.

Note: A recent development of the Gask-O-Seal principle indicates effective sealing in the temperature ranges of −400° to +1000° for specific applications.

Parker
SEAL COMPANY
CULVER CITY, CALIF. • CLEVELAND, 12, OHIO
A DIVISION OF Parker Hannifin CORPORATION

ARE YOU LOOKING . . .

for more information on any of the products or services mentioned in this issue of CHEMICAL PROCESSING?

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to use and can save time. Every month you will find a number at the end of each article or advertisement. Find this number on the slip and check it.

If several items from the same manufacturer are listed in the story, just write the item down in the space provided on the Reader Service slip. Don't forget to include the key number.

Then fill out the slip and mail it to Reader Service Department.

We will contact the manufacturer for you.

Additional details will be sent direct to you.

Be sure . . .

to fill in the slip with the other pertinent information: your name, title, company, product made, and address.

Check 2264 opposite last page

Foreign Trade — *From page 87*

firm is a subsidiary of the Standard Oil Company of California. Its principal responsibility is to handle the many special problems associated with overseas marketing and to strengthen the competitive position of Oronite products in foreign countries.

California Chemical International opened for business exactly 15 years to the day after the establishment of Oronite itself. It was in March, 1943, when America's war effort was shifting into high gear, that Oronite went on stream commercially. The company was created to centralize responsibility for the development, manufacture, and marketing of Standard of California's industrial chemical products.

Over the next two years Oronite made many significant contributions to the war effort, such as napalm for the Chemical Warfare Service, phthalic anhydride for alkyd paints and insect repellents, cresylic acid for insecticides and germicides, and copper naphthenate for fabric preservative.

Following the war the company continued to develop several new products, most of them based on the scientific unfolding of the hydrocarbon molecule. Oronite became the first U.S. supplier of phthalic anhydride from petroleum and the developer of Alkane, the synthetic detergent raw material which has changed the world's washing habits.

Today the company produces a broad line of industrial petrochemicals from its plants in Richmond and El Segundo, California, and in Oak Point, Louisiana. Principal products include Alkane, phthalic anhydride, phenol, polybutenes, xylene intermediates, gas odorants, lube oil additives, acetone, and a recent contribution to the resin field, isophthalic acid. (Article on new paint based on isophthalic acid resin starts on page 67, October CP.)

Oronite's entry into overseas markets occurred almost simultaneously with the company's founding. While the exact date is difficult to pinpoint, a shipment of cresylic acid to Chile early in 1943 probably constituted the company's first foreign export. Throughout the remainder of the war Oronite shipped a steady stream of petrochemicals to such countries as England, Canada, Chile and to our armed forces overseas.

In the years immediately following the war the company's efforts were concentrated on establishing domestic markets. Nevertheless, our overseas volume reached $1,000,000 in 1948. At that time we had no overseas representatives, but simply worked through exporters.

Foreign Sales Grow

In 1949 the company decided to set up a small export sales department and actively seek foreign markets. Various countries were studied and surveyed for sales possibilities, jobbers were contacted, and bulk terminals established in key areas. The results, measured in a rising sales curve, began to show up over the next two years when our export volume more than tripled.

Statistics compiled over the past ten years indicate that Oronite's export sales have more than kept pace with the company's steady growth. In 1947, for example, exports accounted for approximately 5% of the company's total volume. Last year the figure was over 22%. The annual rate of growth in export volume over the ten-year period has averaged 44%.

While the overseas demand for petrochemical products fluctuates from year to year, just as here in the United States, there are three major products which traditionally account for a substantial share of Oronite's total volume. These are Alkane, oil additives, and paraxylene. Of these three, perhaps the greatest growth potential is in paraxylene, basic material for synthetic fibers.

Oronite has also established a firm and growing market for such products as phenol, acetone, isophthalic, polybutenes, and gas odorants. Geographically, the company's principal foreign markets are Latin America, Western Europe, and Japan.

Improved Customer Service

With the recent establishment of California Chemical International, Oronite now has extensive coverage of foreign markets and greater efficiency in its entire overseas operation. More important, the new company provides improved service to overseas customers.

At the present time there are six full-time representatives of CCI in foreign areas. Four are headquartered in Geneva, one in Panama City and one in Sac Paulo, Brazil. Theirs is a busy and challenging job. Their principal responsibility is to develop new markets and to lend technical assistance to Oronite distributors and customers. We consider this technical aid an absolute necessity in successful foreign operations and feel that it has been instrumental in gaining many new customers for Oronite products.

I have mentioned briefly the four overseas plants in which Oronite has an interest. The first of these, a facility at Hull, England, for producing oil additives, was established in 1953. Others have gone on stream in succeeding years. These include an Alkane-producing plant at Grangemouth, Scotland and another Alkane plant near Le Havre, France. An oil additive facility, also near Le Havre, will be completed shortly.

Oronite's policy, and one which is shared by most American companies overseas, is to place a few key technical people in these plants during the start-up period. Once the plant is operating successfully, however, these people are brought back to the United States and the management reins turned over to local engineers and technicians. In no case does Oronite maintain a permanent American staff at any of its foreign plants.

Frequent management meetings are called by Mr. Hughes to discuss important company business and to obtain a good cross-section of management opinion. Shown at this particular meeting are (left to right) J. T. Deane, vice president of manufacturing; W. C. Kaul, comptroller; E. B. Chiswell, executive secretary of California Chemical Co.; G. M. Cook, Mr. Hughes' assistant, and Mr. Hughes

Exporting Technical Knowhow

Oronite also occasionally enters into licensing agreements with foreign companies by which we export our technical knowhow. It is this technical knowledge which we consider among the most significant contributions of American business firms to free world progress and stability. In some areas, particularly countries like Germany, there is an adequate supply of engineering knowledge and skill. In others, however, there is a definite need for people to be trained not only in how to produce chemicals but in how to *use*

ORBIT VALVES

ORBIT VALVES shown in above picture are installed on ammonia loading dock, Lake Charles, Louisiana. Valves and piping are coated for protection against external corrosion.

Orbit forged steel ASA class valves were chosen for the above installation because they shut off positively and are easy to operate. In addition, all forged steel parts are used in the construction of Orbit valves — this, together with the welded bonnet attachment and adjustable, pliable stem packing and non-lubricated feature, makes up an integral pressure vessel that is the last word in safety and economy.

Please specify service intended when ordering Orbit valves. For other special applications, our industrial division will be glad to help you with your particular service problems.

Orbit valves have a long history of performance in: AMMONIA, HYDROGEN, NITROGEN and HYDROCARBONS. Watch these ads for additional facts about Orbit valves and recommended services.

SIZES: 1", 1½", 2", 2½", 3" and 4" ASA 300-lb thru 2500-lb, full opening flanged and screwed ends. Venturi opening available in sizes: 2", 2½", 3" 4" and 6" ASA 150-lb. thru 2500-lb. flanged ends only.

SOURCE: Through your favorite industrial supply house.

LITERATURE: Write Department B for Catalog 58-B.

ORBIT VALVE COMPANY

P. O. BOX 699, TULSA, OKLAHOMA, Phone LUther 4-4761, TWX TU 925
WAREHOUSES: HOUSTON, TEXAS, 407 Velasco, CApitol 8-6623, TWX HO 115; ODESSA, TEXAS, 402 West County Road, FEderal 7-2263, TWX ODESSA TEX 8706; LAFAYETTE, LOUISIANA, 3111 Cameron St., CEnter 4-3326; CASPER, WYOMING, 414 South Elm Street, Phone 2-1324; EDMONTON, ALBERTA, CANADA, 7119-104th St., Phone 391-283. WEST COAST REPRESENTATIVES: Charles Lowe Company, 383 Fourth Street, San Francisco, Calif.; Marshall E. Niedecker Company, 2785 Cherry Ave., Signal Hill, Calif. CANADIAN REPRESENTATIVES: T. R. Pickford & Company, Ltd., Calgary, Alberta, 309 7th Avenue West; Amherst 2-7371 EXPORT REPRESENTATIVE: New York 36, N. Y., 500 Fifth Avenue, Bryant 9-2236

Check 2265 opposite last page

them. The success of our overseas operation is determined to a large extent upon how well we fulfill that need.

To the uninitiated, the export success of Oronite and other U.S. chemical producers may indicate that overseas marketing is a smooth and easy road, one that is paved with low costs and high profits.

As anyone who has sold anything overseas — whether it be chemicals or harmonicas — can testify, such is not the case. There are problems, numerous and formidable. There are currency exchanges, for example, which limit and in many cases effectively prohibit the importation of U.S. goods into certain areas. There are treaty agreements, tariff regulations, import restrictions — all varying from country to country.

Selling costs are considerably higher than in the U.S., chiefly because of increased freight charges, the expense of maintaining an overseas staff, the commissions to jobbers and the tariff and import duties. A high working capital is required to maintain overseas inventories and to live with the longer term credit usually applicable in foreign markets. In addition, there is the competition — not only from aggressive foreign producers, but from U.S. manufacturers as well.

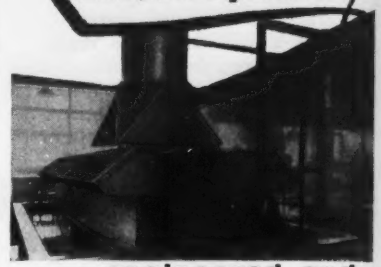
Despite these obstacles, it is likely that America's participation in overseas markets will continue to grow, that is if American producers and their sales agents will conduct their foreign operations in a manner which will bring credit to their products and to themselves.

Occasionally there are instances of U.S. business firms employing shortsighted marketing practices overseas to bring themselves a quick profit. Still others are inclined to look to foreign markets when business slows at home, then forsake their overseas customers when domestic conditions improve.

These types of "businessmen" — who are fortunately

To page 92

Complete Corrosion Proof Plastic Ventilating And Exhaust Systems

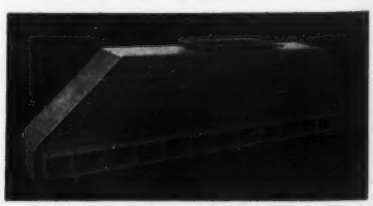


. . . engineered and built to specifications, save maintenance dollars . . . cut downtime

■ Wherever corrosive fumes must be handled, Agilide (PVC) or Agilene (polyethylene) exhaust and ventilating systems will do the job at far less cost. Made entirely of rigid and durable plastic, they afford *complete* protection from corrosion. There are no coatings to chip or peel — no weak spots and no metal parts to corrode.

Agilene (polyethylene) and Agilide (PVC) installations are widely used in the chemical and allied industries, as well as for pickling, plating and reactor exhausting, dust removal, etc. They quickly pay for themselves by outlasting previously used materials.

Write for full details on Agilene and Agilide corrosive resistant exhaust systems . . . there are components to cover all phases of fume ventilation from the exhaust hood — to fan — to the weather cap above the roof.



Agilene (polyethylene) exhaust hoods can be built to your specifications.

Agilene (polyethylene) seamless ducting and duct fittings are available from stock in a variety of sizes.

Agilene (polyethylene) centrifugal fans are fabricated completely of plastic in capacities from 185 to 2350 CFM.

AMERICAN AGILE Corp.

5461 DUNHAM RD. • MAPLE HEIGHTS, O.

AGILENE AGILIDE

Acknowledged pioneers in the welding and engineering of structural plastics.

Check 2266 opposite last page

THAT'S INTERESTING

Adventurer? Dig this

All wig wags please note the "Adventures in Pastel Coiffures", as Mme. Tovar of Interesting Designs, Inc. tags her wigs of 100% Dynel, Union Carbide's acrylic fiber. Predicted to pull the skids from under the high-priced Parisian wig market, the female Dynel dome doilies sell for only $35 per "transformation".

Yum, yum

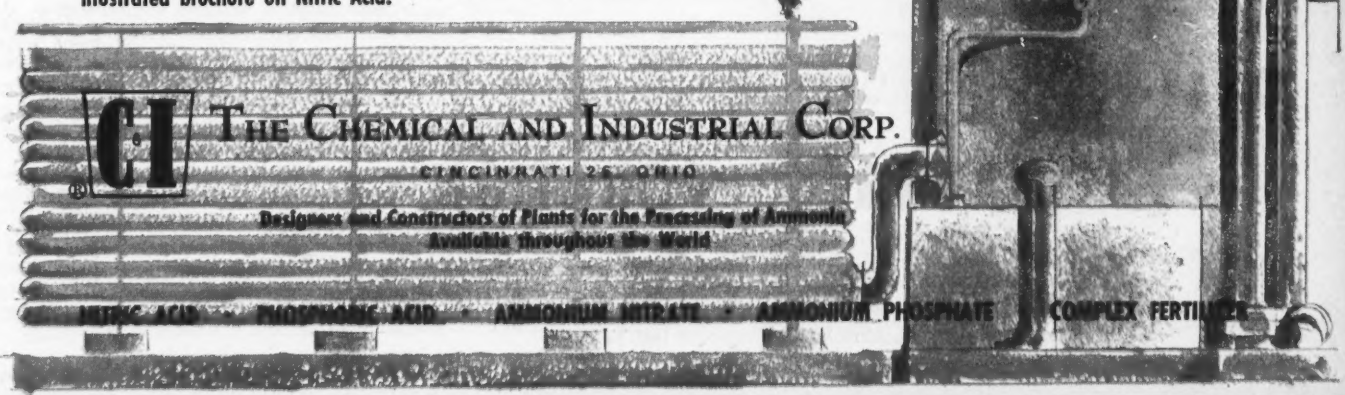
You probably thought ice cream was invented in the U.S., but actually, this yummy desert was not really invented. It probably came into being as a result of water ices popular during the early medieval period. First ice cream production figures record some 815,000 gal, compared to the 844,000,000 gal produced in 1957. (*The Givaudan Flavorist*, Givaudan Flavors, Inc.)

For more information on product at right, specify 2267 see information request blank opposite last page.

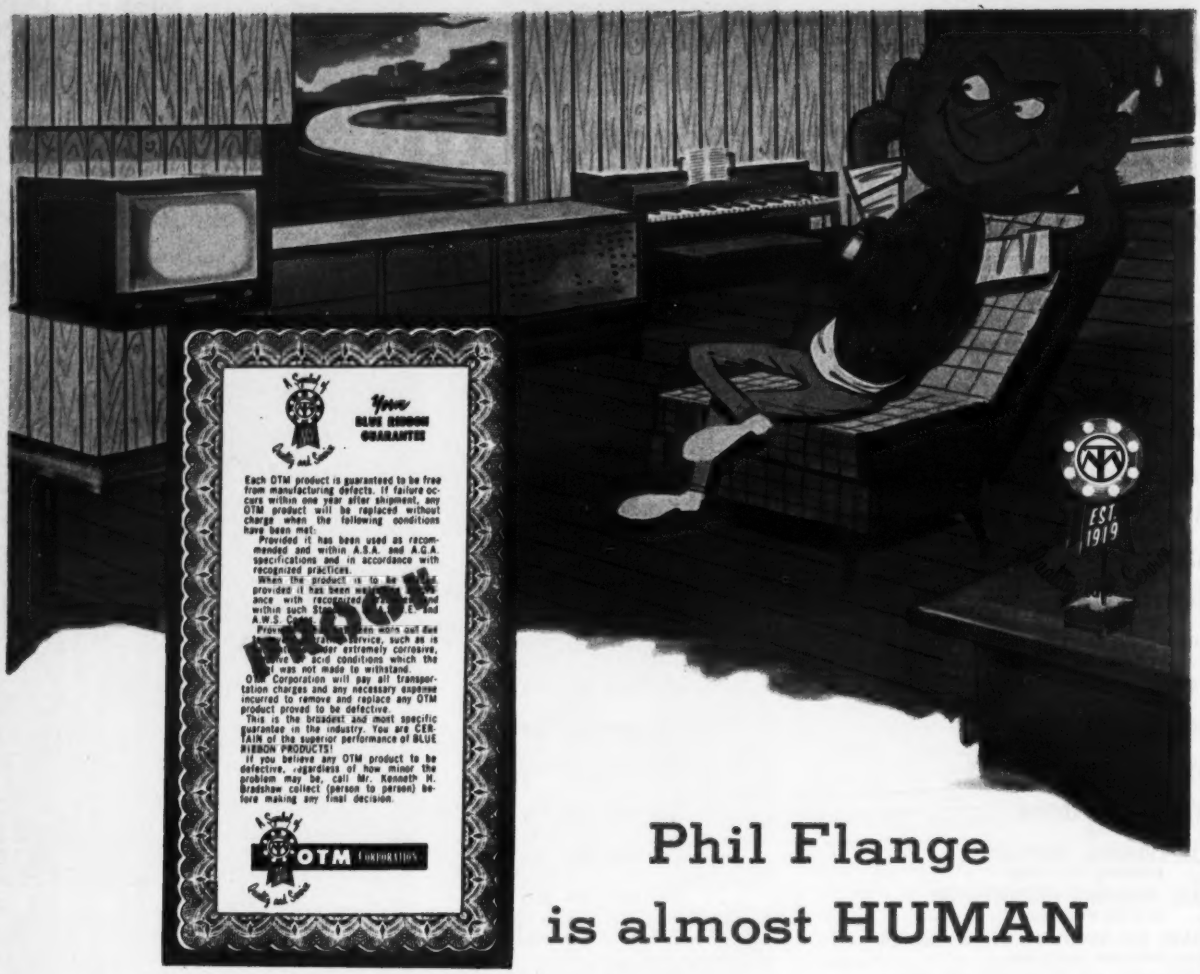
the real story behind C&I leadership in NITRIC ACID PRODUCTION

AFRICAN EXPLOSIVES & CHEMICAL INDUSTRIES, LTD. Modderfontein, Union of South Africa	150 tons per day
ALLIED CHEMICAL CORPORATION Omaha, Nebraska	250 tons per day
ATLAS POWDER COMPANY Joplin, Missouri	250 tons per day
COLLIER CARBON AND CHEMICAL CORPORATION Brea, California	120 tons per day
CALUMET NITROGEN PRODUCTS COMPANY Whiting, Indiana	120 tons per day
CHEMSTRAND CORPORATION Pensacola, Florida	300 tons per day
COMMERCIAL SOLVENTS CORPORATION Sterlington, Louisiana	450 tons per day
FISONS LIMITED Stanford-le-Hope on the Thames, England	250 tons per day
MISSISSIPPI CHEMICAL CORPORATION Yazoo City, Mississippi	330 tons per day
MISSISSIPPI RIVER CHEMICAL COMPANY Selma, Missouri	250 tons per day
NORTHWEST NITRO-CHEMICALS, LTD. Medicine Hat, Alberta, Canada	120 tons per day
OLIN MATHIESON CHEMICAL CORPORATION Ordill, Illinois	150 tons per day
PHILLIPS CHEMICAL COMPANY Etter, Texas	120 tons per day
POTASSE & ENGRAIS CHIMIQUES Grand Couronne, France	150 tons per day
SOCIETA ITALIANA EDISON Sicily, Italy	500 tons per day
SPENCER CHEMICAL COMPANY Vicksburg, Mississippi	120 tons per day
ST. PAUL AMMONIA PRODUCTS, INC. St. Paul, Minnesota	200 tons per day
STANDARD OIL COMPANY OF CALIFORNIA Richmond, California	250 tons per day
THE STANDARD OIL COMPANY OF OHIO Lima, Ohio	180 tons per day
TENNESSEE VALLEY AUTHORITY Wilson Dam, Alabama	120 tons per day
THE TEXAS COMPANY Lockport, Illinois	200 tons per day
U. S. INDUSTRIAL CHEMICALS COMPANY Tuscola, Illinois	120 tons per day
PAKISTAN INDUSTRIAL DEVELOPMENT CORPORATION Multan City, West Pakistan	200 tons per day
TOTAL: daily production	**4,900 tons per day**

If you are considering nitric acid anywhere in the world, discuss your project with C&I. For more information about the advantages of C&I designed plants, send for our illustrated brochure on Nitric Acid.



C&I THE CHEMICAL AND INDUSTRIAL CORP.
CINCINNATI 26, OHIO
Designers and Constructors of Plants for the Processing of Ammonia
Available throughout the World
NITRIC ACID · PHOSPHORIC ACID · AMMONIUM NITRATE · AMMONIUM PHOSPHATE · COMPLEX FERTILIZER



Phil Flange is almost HUMAN

and we emphasize ALMOST because humans are not perfect but Phil is

He is one of the Blue Ribbon products made by OTM Corporation (he got a trophy for it, too!) . . . so Phil had to be a perfect forging in the first place. Then he was finished so fine that you could grade a micrometer on him. After that, he was checked and rechecked again and again . . . to make sure that when you get him he will be perfect. Phil is pretty proud of that Blue Ribbon Trophy too . . . because only the finest flanges and fittings can win the OTM Blue Ribbon Guarantee — a symbol of quality and service.

OTM FLANGES PROVE THE ECONOMY OF PERFECTION

OTM CORPORATION

P.O. Box 19296 Houston 24, Texas UN 2-6643

A-2 '58

Odessa — Dallas — New York — Tulsa — Baton Rouge — Los Angeles

Check 2268 opposite last page

From page 90

in a small minority — are helping neither themselves, their industry nor their country. By giving only lip service to sound business principles, they ignore a basic fact:

The future of American business overseas and our reception in foreign markets depends upon our ability to produce good products, to offer them at honest prices, to provide quick and efficient service and to treat each customer in a fair and business-like manner. Anything short of this will, in the long run, prove unprofitable and will harm the reputation of every American exporter.

If, on the other hand, we fulfill our obligations to ourselves and to our customers, wherever they may be, our businesses will continue to grow and prosper.

Air-velocity slide rule serves as a handy calculator for air conditioning, heating, and ventilating problems. Front side of sliding scale shows air velocity corresponding to impact pressure from .01 to 10" of water, compensated for air density. Back side provides a means of determining exact air density with corrections for relative humidity dry bulb temperature and barometric pressure. Calculator was developed by manufacturer of pitot tubes and air-velocity meters. Air-velocity slide rule available without charge — F. W. Dwyer Mfg. Co., Dept. CPC, PO Box 373, Michigan City, Indiana.

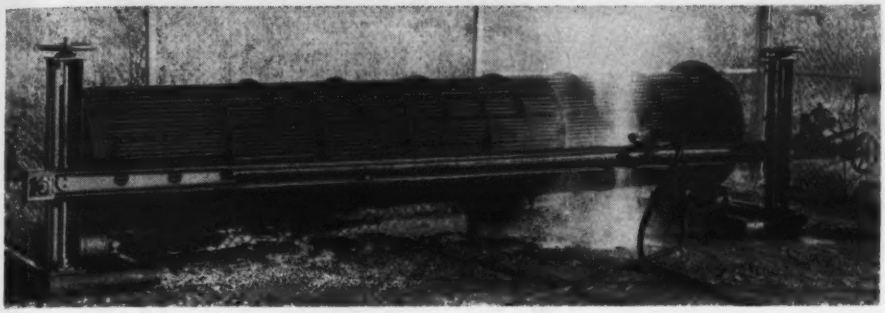
Check 2269 opposite last page.

Cement lining of pipes from 4 to 144" in diameter is described in 20-page catalog. Featured in catalog is new machine which centrifugally lines pipe as small as 4" and requires no excavation at laterals. "The Centriline Process" — Centriline Corp., subs. of Raymond International Inc., 140 Cedar St., New York 6, N.Y.

Check 2270 opposite last page.

Furnace tubing is subject of 11-page technical paper. Article explains factors involved in selection of proper furnace tubing for refinery and petrochemical service. Bul TR-559 — The Babcock & Wilcox Co., Beaver Falls, Pa.

Check 2271 opposite last page.



Permitting unit to be placed back on stream sooner, system employing high-pressure water jets,

cleans heat exchanger bundles quickly and thoroughly

After method is used at one plant, refiner commented that bundles were cleaner than they had been the past 13 years.

Speed of cleaning and the effectiveness with which deposits are removed are advantages of economical method for cleaning heat exchanger bundles. System employs high-pressure water jets and uses a motor to move jets back and forth and turn bundle.

Although time for cleaning varies according to nature of deposits, in one typical plant a bundle 4′ in diameter and 16′ long was thoroughly cleaned in slightly more than one hour. Deposits, consisting primarily of iron oxides with some hydrocarbons, were completely removed. Badly fouled bundles may require repeat jettings, cleaning requiring as long as eight hours in some cases.

Thoroughness of cleaning is shown by experience at another plant where three rectangular bundles — 5′ high, 1′ wide, and 16′ long — were jetted. Cleaning service was so effective that refiner commented that bundles were cleaner than they had been at any time in the last 13 years.

At another plant a bundle 1½′ in diameter and 20′ long had deposits of fairly loose, dry material. Pitch of brass tubes was so close that it was impossible to insert a knife between them. High-pressure jetting tool cleaned bundles so well that tubes were a bright brass color.

Bundle cleaner consists of two bases between which extends a movable beam supporting the hydraulic jetting head. This jet head is mounted on a trolley that is propelled along supporting channel beam by a motor.

Bundle being cleaned rests on flanged rollers, which permit the bundle to be rotated so that it can be jetted from different directions. Flanged rollers can be positioned at various distances from the jet head to accommodate bundles of different diameters.

In operation, an electric motor moves the trolley-mounted hydraulic jet head back and forth along the beam. The motor also raises or lowers the entire beam assembly either 1¼ or 2½″ during each round trip of the trolley from one end of the beam to the other.

Jet head delivers cleaning liquid at pressure of 3000 psi. Number and size of jet orifices and flow rate can be varied according to requirements.

Heat exchanger jetting tool has removed practically every type of deposit from bundles, including those which have been impossible to remove by other methods. Extremely heavy asphaltic material has been difficult to remove with jets, but present research work indicates that a variation in method may solve this problem.

(Heat exchanger cleaning method is development of Dowell Div., The Dow Chemical Co., PO Box 536, Tulsa, Okla.)

Check 2272 opposite last page.

FULLY SOLUTION ANNEALED...

Republic ELECTRUNITE Stainless Steel Tubing and Pipe

Republic ELECTRUNITE® is welded by an exclusive process that unites the wall under pressure without foreign or extra metal. Tests prove the ELECTRUNITE weld is as strong or stronger than the original base metal. All ELECTRUNITE Stainless Steel Pressure Tubing is fully solution annealed for maximum corrosion-resistance. Available in a wide range of sizes to solve every installation problem. Call your Republic ELECTRUNITE distributor.

Send for FREE 60-page brochure. Write today!

REPUBLIC STEEL
STEEL AND TUBES DIVISION
207 East 131st Street • Cleveland 8, Ohio

Check 2273 opposite last page

from blueprint plans
PUGET SOUND FABRICATES

LINED VESSELS

Protective lined tanks guard against contamination

...for the Chemical Processing Industry on the West Coast.

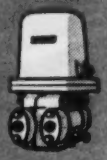
You can save on transportation costs, manufacturing time and gain the dependability of over 58 years of custom fabricating experience when you call on Puget Sound as your West Coast source for process and plant equipment in steel plate and alloys up to 1″. Send prints for prompt quotation on your next job.

Request Brochure No. M-58

PUGET SOUND FABRICATORS, INC.
Craftsmen in Metals
3670 E. Marginal Way • Seattle 4, Washington

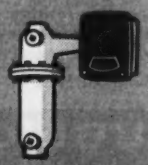
Check 2274 opposite last page

Indicating Motion-Balance Transmitters
...for flow, pressure, and level



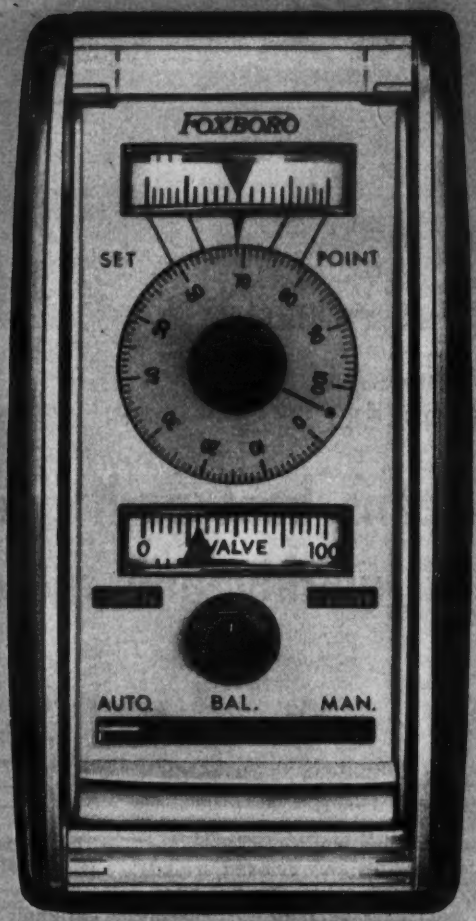
Low Displacement Force-Balance Transmitters
...for flow, pressure, and level

Thermocouple and Resistance Bulb Converters
...magnetic amplifiers...no vibrators
...no mechanical rebalancing



Displacer Level Transmitters
...force-balance for simplicity

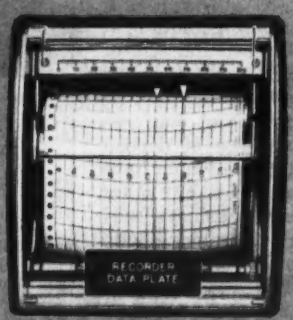
Control Valves
...electro-pneumatic and electro-hydraulic actuators



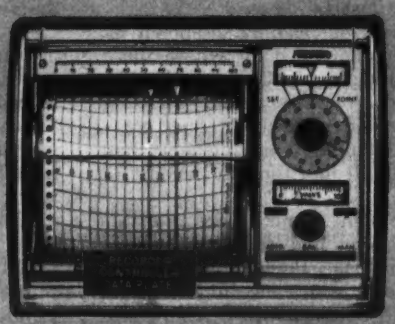
CONTROLLER
The Electronic Consotrol Controller (shown 4/5 actual size) concentrates all control and supervisory functions in one slim 3 x 6 inch case. Controller operation is entirely independent of recorder.

FOXBORO Electronic

REG. U.S. PAT. OFF.



RECORDER
Electronic Consotrol Recorders (shown ¼ actual size) use a simple, powerful pen motor which can be operated directly from transmitter signal without amplification. Available in 1 and 2 pen models.



COMBINED RECORDER-CONTROLLER
Electronic Consotrol housing design permits unequalled flexibility in panel arrangement. Recorders and controllers can be mounted separately in individual housings—or enclosed in a compound unit. Regardless of mounting, either unit pulls out independently.

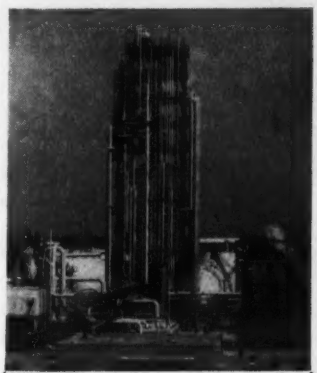
Book covers advances in petroleum chemistry

Initial volume of 641 pages in series on latest developments in petroleum chemistry has an interesting 44-page chapter on the manufacture of solid polymers, such as synthetic rubbers and plastics, from olefins. Bibliography of 108 references is included. Editors are Kenneth A. Kobe and John J. McKetta Jr.

Another chapter covers the oxo process and a third, solvent refining. Other chapters discuss fractionating-tray designs, distillation, crystallization, alkylation, catalytic reforming, economics and future trends.

(To obtain "Advances in Petroleum Chemistry and Refining Vol. I," remit $13.50 to Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N.Y.)

Check 2276 opposite last page.



High-purity ethylene . . .

. . . is produced from a mixture of refinery gases by distillation process used by this new ethylene-purification unit. Placed in service at Esso Standard Oil Company's refinery in Baton Rouge, La., most of the unit's output will go to industries in the Baton Rouge area for use in making a variety of petrochemical products.

(Information courtesy of Esso Standard Oil Co., 15 West 51st St., New York 19, N.Y.)

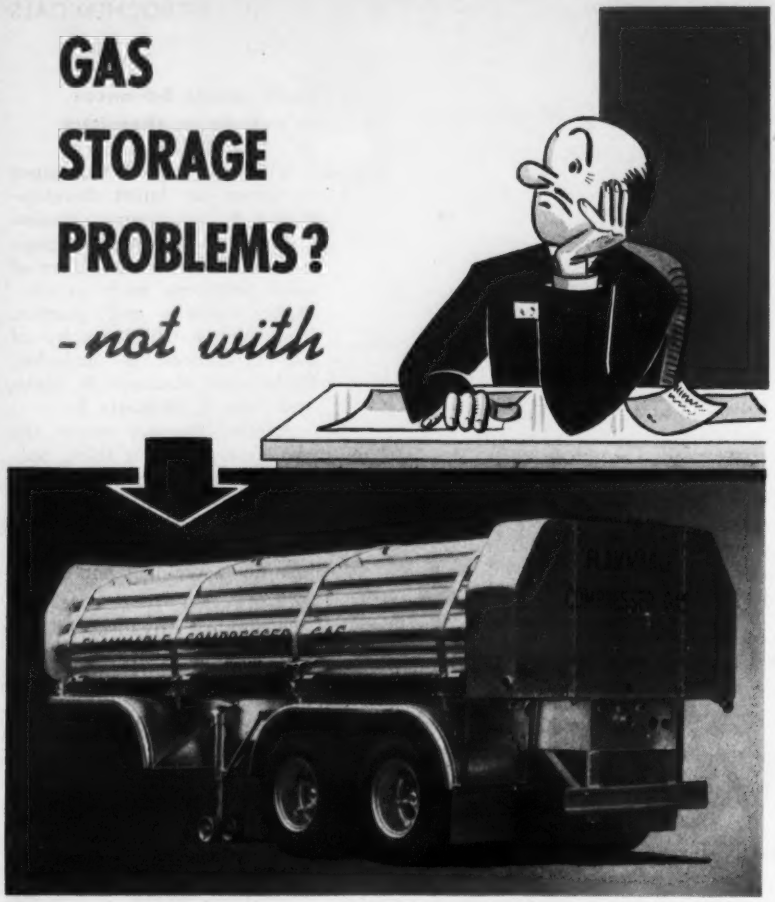
for the first time... the 100% solid state electronic system!

- thermocouple and resistance bulb converters–using magnetic amplifiers
- choice of force-balance and motion-balance transmitters
- long time-constant tubeless controllers

Consotrol Instrumentation

Electronic Consotrol* Instrumentation—the most complete and advanced family of electronic-operated measurement and control instruments available today! That just begins to describe Foxboro's dramatic new advance in instrumentation. ✓ ✓ ✓ Foxboro electronic transmitters, indicators, recorders, control stations, computing stations, valve actuators and other final operators cover every function in the control loop. All are linked by a d.c. current signal. All are completely tubeless. Even thermocouple and resistance-type systems no longer require vacuum tubes. ✓ ✓ ✓ Electronic Consotrol systems convert temperature, pressure, flow, level measurement, etc., to a proportional signal **at the transmitter.** Transmission to a remote control station is instantaneous—using an electronic motion-balance or force-balance transmitter. Designs are available for both hazardous and non-hazardous areas. ✓ ✓ ✓ Electronic Consotrol Instrumentation heralds a whole new era in process control engineering. Write Foxboro today for the new 32-page Catalog 21-10 which gives full details. **The Foxboro Company, 8111 Neponset Ave., Foxboro, Mass., U.S.A.** *Reg. U.S. Pat. Off.

Check 2275 opposite last page



TAYLOR-WHARTON
MOBILE GAS STORAGE

You have no need to worry about gas storage problems when you use Taylor-Wharton mobile gas transports. Using them provides substantial savings and greater mobility of operations. Oil refining, petrochemical, food processing and electronic companies can make good use of these Taylor-Wharton transports to cut costs and expedite inter-plant haulage. Each tube meets I.C.C.-3A2400 specifications, is completely heat-treated. Transports consists of a group of 2400 p.s.i. seamless steel storage pressure tubes rigidly mounted to a single or double axle model trailer with capacities ranging from 38,500 to 56,250 cu. ft.

More than a Century in Harrisburg 24, Pa.

HARRISBURG STEEL CO.
Division of HARSCO CORPORATION

Check 2277 opposite last page

PETROCHEMICALS

Cargo hose drainage reduced through use of butterfly valve

Service experience of the Inland Waterways Dept. of Esso Standard Oil Company indicates that product spillage from cargo hose can be substantially reduced through the use of simple, light-weight butterfly valves which are being used on the ends of cargo hoses on the 9,600 barrel tanker, M/V Esso Chesapeake. In addition to minimizing product loss, the valve helps to eliminate waterways pollution and provides safer operating conditions by solving the problem of hose drainage.

Butterfly valve on dock loading hose designed for handling of oil and other products without any spillage

Nature of the tanker's Chesapeake Bay service, which is characterized by short runs and frequent loading and discharging of several grades of petroleum products through three separate hose sections, pointed up the need for such a hose-end closure.

Operational sequence in using the valve is as follows: With the valve in a closed position, the outboard flange is aligned and bolted to the shore flange in the conventional manner. After the hose-end valve and shore valves are opened, discharge or loading can begin. When either discharging or loading has been completed, both the hose-end valve and the shore line valve are closed and the bolting can be disconnected.

Product remaining in the cargo hose is retained by the valve, precluding necessity of blanking the end flange during transit.

Valve used is one of the butterfly manual operated type. It has an aluminum body and a resilient sealing ring with a bronze disc. Its construction requires sandwich mounting between the usual hose-end flange and an additional end flange secured by bolting. Due to the design of the butterfly disc, a low resistance to flow characteristic through the open valve is achieved. The pressure differential across the valve would be about one half a pound per square inch when 1400 gpm of water is passed through it.

(Butterfly valves are product of Keystone Valve Corp., 5325 Kirby Dr., Houston 5, Texas.)

Check 2278 opposite last page.

Major ethylene plants "on stream" in Japan

Two major U.S.-designed ethylene plants have gone "on stream" in Japan. At Iwakuni City near Hiroshima, Japan, is a 20,000-metric-ton-per-year unit belonging to Mitsui Petrochemical Industries, Ltd. The other plant is a 12,000-metric-ton-per-year unit for Sumitomo Chemical Company, Ltd., located at Niihama on the Island of Shikoku, south of Japan's Inland Sea.

The Mitsui ethylene plant obtains its feed stock from a nearby refinery, and the other ethylene product is used for making polyethylene by the Ziegler process. The Sumitomo ethylene also is used for the production of polyethylene by the Imperial Chemical Industries, Ltd., high pressure process. A phenol and acetone plant, also U.S. designed, is expected to go on stream for Mitsui Petrochemical at Iwakuni City shortly.

(Japanese ethylene plants were designed by Stone & Webster Engineering Corp., 90 Broad St., New York, New York.)

Rotary positive blowers bulletin of 8-pages includes capacities and pressure ratings, along with design and construction information. Bul AF-258 — Roots-Connersville Blower, Division of Dresser Industries Inc., 900 West Mount Street, Connersville, Indiana.

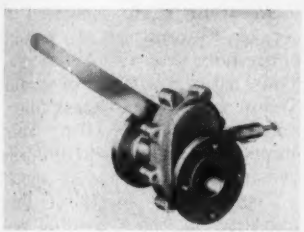
Check 2279 opposite last page.

Fast, easy flow shut-off, tight closure provided up to 500 psi

Uses: For controlling flow of fluid where possible slight contamination of the stream by the lubricant is inconsequential.

Features: At pressures as high as 500 psi, unit shows easy, tight closure with no leakage. It provides long, trouble-free service at extremely low expense.

Description: The gate or disc of lubricated swing gate valve is first swung into closed position by the hand lever. Then, to assure positive tightness, a plastic lubricant is forced down through channels by turning the hand screw



Lubricated swing gate valve

projecting from the valve body. The high pressure of this lubricant against the periphery of the gate and its seat holds the faces of the gate tight against the body.

When the lubricant is under pressure, the little cock on the lubricator is closed. To open the valve, the cock is opened and the screw is backed off to relieve the lubricant pressure in the valve body and the disc lever is moved without any difficulty.

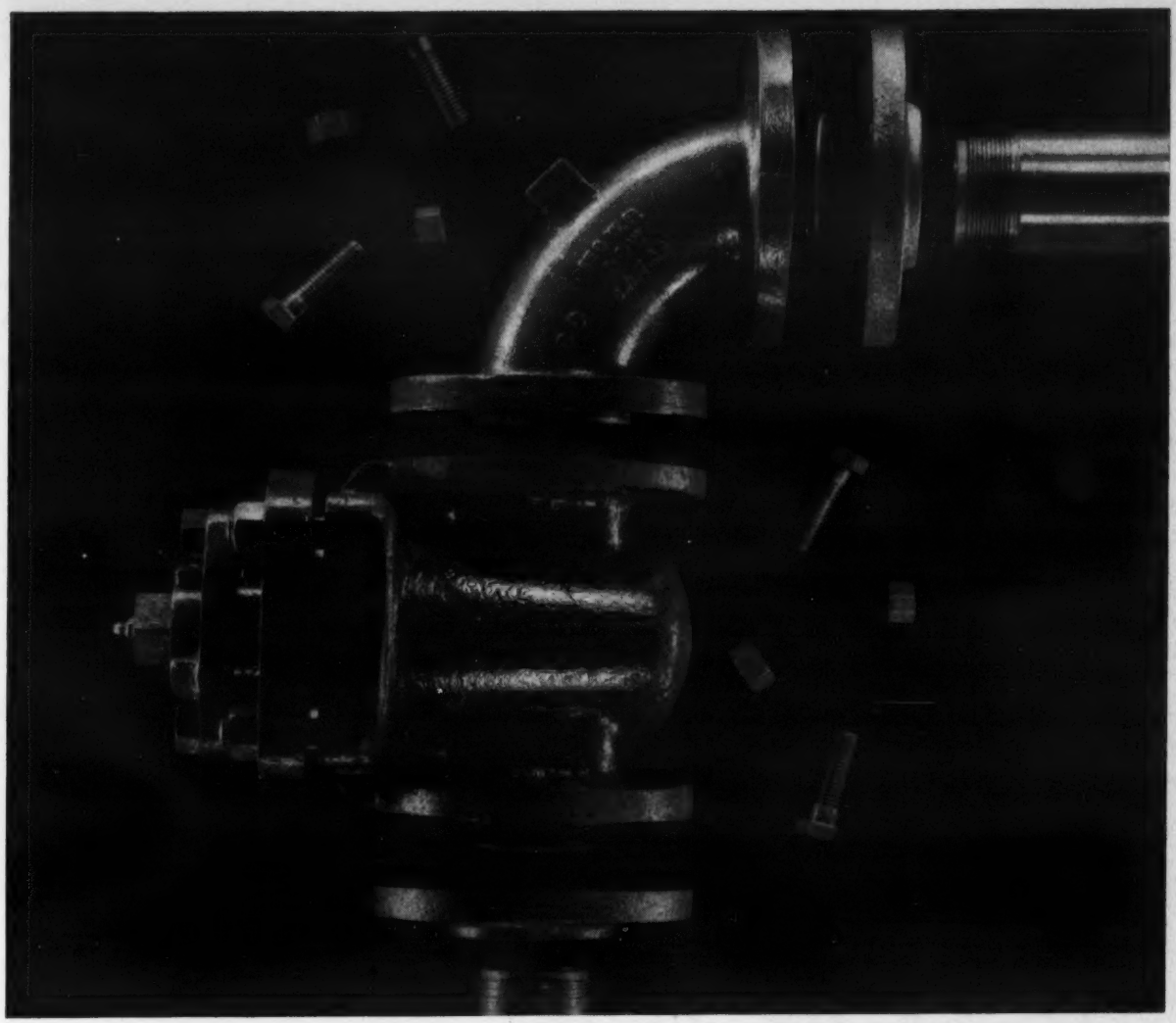
Valve is available in any cast iron and other alloys in 1½ and 2½" sizes.

("Lubeseal" valve is product of W. S. Rockwell Co., 200 Eliot St., Fairfield, Conn.)

Check 2280 opposite last page.

Storage tanks of all types are illustrated and described in 36-page catalog. Recently introduced floating cover for small vertical tanks is also included. Cat 58G — Hammond Iron Works, 744 Broad St., Newark 2, N. J.

Check 2281 opposite last page.



You can see why Saran lined pipe cuts operating costs

These corrosion-resistant pipes, fittings and valves are stock items, and they can be fabricated in the field

The long range economy of Saran lined pipe starts right here—with the immediate availability of pipe, fittings and valves . . . as stock items. There's no waiting . . . no price premium to pay.

And Saran lined pipe can be fabricated in the field. Only conventional hand tools or power equipment are needed to cut and thread it right on the job site.

Saran lined pipe pays off through the years with superior corrosion resistance and strength. When you specify the new gray Saran lined pipe, valves, pumps and fittings, you'll be able to pipe commonly used acids, alkalies and other corrosive liquids under a wider temperature range.

You can plan a *complete* corrosion-free pipe system with Saran lined pipe, valves, pumps and fittings. They're available for systems operating from full vacuum up to 300 psi and temperatures from −20° F to 200° F. Send the coupon today for further information. And be sure to ask about Saraloy® 898 tank lining, too. THE DOW CHEMICAL COMPANY, Midland, Michigan.

SARAN LINED PIPE COMPANY
DEPT. 2002B-1
2415 BURDETTE AVENUE
FERNDALE 20, MICHIGAN

Please send me information on: ☐ Saran lined pipe, fittings and valves ☐ Saran lined centrifugal pumps ☐ Saraloy 898 chemical resistant sheeting

Name_____ Title_____ Company_____

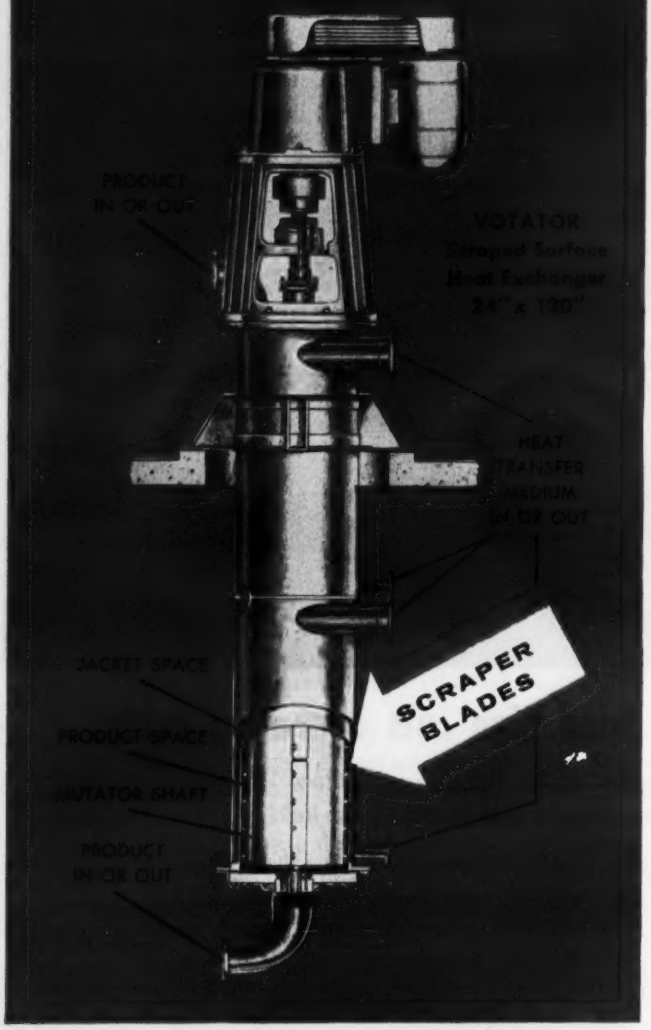
Address_____ City_____ State_____

YOU CAN DEPEND ON DOW

Check 2282 opposite last page

Votator®
SCRAPED SURFACE
HEAT EXCHANGERS

...key to high
heat-transfer efficiency



WHETHER YOU ARE developing a new process or improving your existing process, you'll get profitable help from VOTATOR* SCRAPED SURFACE Heat Exchangers. These units process heat-sensitive or viscous liquids continuously under closely controlled temperature and pressure. The unexcelled heat transfer rates obtainable are due to design principles wherein violent agitation, combined with continuous scraping of the heat transfer surface, produces thin films and high turbulence. Internal design provides a high ratio of heat transfer surface to volume of material and features high jacket velocities and turbulent flow of the heat transfer medium. Since processing is continuous, high throughput rates are obtained in small sized equipment.

VOTATOR Heat Exchangers are available in sizes of 0.7 square feet to 60 square feet of heat transfer surface . . . in capacities of 50 to 50,000 pounds/hour . . . for indoor or outdoor installation. Write for complete information.

*VOTATOR and THERMEX – Reg. U. S. Pat. Off.

OVERALL HEAT TRANSFER RANGES

Material	Overall U Range (BTU/HR/FT²/°F)
Thin Liquid	400 – 700
Viscous Liquid	150 – 400
Crystallization	150 – 650
Sulfonation	150 – 400
Polymerization	200 – 500

GIRDLER PROCESS EQUIPMENT DIVISION
CHEMETRON CORPORATION
CHEMETRON

Check 2283 opposite last page

Special piston rings protect compressor for two years

Previous type had life of only four months

Problem: Conventional carbon piston rings used in a compressor at a major chemical plant in the Southwest gave four months maximum service. Cast iron rings could not be used in this application because they required lubrication, which could cause product contamination.

Compressor was a 3¼ x 5, single-stage, double-acting unit that was originally in nitrogen service. Compressor speed was 300 rpm and gases were compressed to 100 psi at 90°F.

Solution: Plant installed a set of Fluorogreen L piston rings more than two years ago. These rings are made of virgin Teflon, micro-sized glass fiber, and compound E-101. This compound insures uniform density, eliminates soft spots.

Piston rings made of this material have outstanding resistance to wear, chemicals, and moisture. Strength and flexibility are excellent. Thermal stability is satisfactory to 400°F or higher. Rings have step-cut joints to prevent leakage throughout operating range. Flat, hoop-type stainless steel expander is furnished with each one-piece compressor ring.

Results: These piston rings operated satisfactorily in continuous service for two years and three months — which can be compared to the four months life obtained with previous rings under same conditions.

(Fluorogreen L piston rings are product of John L. Dore Co., PO Box 7772, Houston 7, Texas.)

Check 2284 opposite last page.

NEXT ISSUE

First synthetic rubber plant in England, which recently went on stream, is discussed in December CP. Flow sheet of process is included, along with discussion of design features.

ADVERTISEMENT—*This entire page is a paid advertisement* *Prepared by U. S. Industrial Chemicals Co.*

U.S.I. CHEMICAL NEWS

★ A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★

Coppedge Named President of National Distillers

Bierwirth Elected Chairman

John E. Bierwirth, president of National Distillers and Chemical Corporation since 1949, has been elected chairman of the board, and Roy F. Coppedge, Jr., 43, an executive vice-president since May, 1957, has been elected president. The office of chairman has been vacant since 1953.

In their new posts, Mr. Bierwirth and Mr. Coppedge will guide company policy and direct operations. The move was made to provide a broader executive base for the company's growing, diversified business. Net sales in 1957 were $539 million as against $470 million in 1952. Industrial chemicals, petrochemicals and special metals currently account for more than 40% of total operating profits. Total investments in these areas now exceed $190 million.

John E. Bierwirth

Roy F. Coppedge, Jr.

Unique Brake Throttles Flow of Sodium Coolant

Engineers working on the Sodium Reactor Experiment (SRE) at Santa Susana, Cal. have brought a unique solution to the problem of reducing flow of liquid sodium coolant while minimizing thermal stresses on the sodium piping and heat exchanger systems. Flow reduction is sometimes necessary to control rate of temperature change in the reactor core.

Two eddy current brakes — one on the secondary, nonradioactive sodium loop, and the other on the outlet side of the primary loop — straddle the coolant pipes and throttle sodium flow from 1,200 gpm to 12 gpm in two seconds. Thermal stresses on the system are kept well below any damaging level using this braking method.

Attention: Users of Tax-Free Alcohol

The Revenue Ruling covering storage of tax-free alcohol has been expanded for purposes of clarification. The regulation previously stated only that a storeroom which can be securely locked must be provided, of sufficient capacity and substantial construction.

The expanded ruling—No. 58-207—adds that these storerooms may also be used for other supplies, provided they are separated from the alcohol, and provided their presence does not interfere with the proper accounting and safety of the alcohol.

Automation Takes Over Communications at U.S.I.; Speeds Chemicals to Customers

Unique New Teletype System for Communications and Electronic Data Processing Links 40 Locations Via 7,500 Miles of Wire. Sales and Plant Personnel Freed of Paper Work.

Taking a cue from the automatic operations of its many chemical and petrochemical plants, U.S.I. has recently extended automation to the clerical side of its business with a tailor-made teletype and data processing system designed primarily to accelerate delivery of chemicals to U.S.I. customers. Specifically, it does these jobs:

- Completes order processing and invoicing with a single typing.
- Is instrumental in production scheduling.
- Compiles sales, order and production statistics.
- Provides statistics for budget and inventory control.
- Handles administrative messages.

U.S.I.'s new teletype setup interconnects 40 plants, shipping points, sales offices and company headquarters in a 7,500-mile network among 27 cities. It is integrated with standard punched-tape coding and programming equipment, that allows immediate reproduction of an original message anywhere along the line. It also acts as an integral part of an electronic data processing operation which makes information currently and simultaneously available to management, sales, production, research, credit, traffic, accounting.

One Typing Completes Order Handling

Here's how it works. Say an order for ethanol is placed in Chicago. An order form is made up at the sales office. In this operation a tape is produced which transmits complete information to the shipping point at Tuscola via teletype. Here the tape automatically produces combination shipping papers and the invoice. At the same time, the information in condensed form is sent to New York and converted to punched cards for data processing.

MORE

Girls at a U.S.I. sales office producing transmittal tapes for orders. Most information is transferred automatically to the tapes from repetitive data tapes and cards.

Ion Exchange Resins Act As Catalysts in Acetone Cyanohydrin Production

Acetone cyanohydrin can now be made experimentally by reacting acetone with hydrogen cyanide in the presence of anionic ion-exchange resins. These resins perform effectively as heterogeneous catalysts for the reaction, research workers have discovered.

However, a way must be found to prolong their process life before the transition to a successful commercial operation can be made. A two-stage continuous flow reactor has already been developed in anticipation of a rapid solution to the problem. It employs a feed of acetone and hydrogen cyanide in the mole ratio of 5:1. At 25°C, 99% conversion is achieved. This feed ratio is required to prevent swelling of the resin, moderate the evolution of heat, and displace the equilibrium in favor of acetone cyanohydrin.

The principal use of acetone cyanohydrin is for the preparation of alpha-methacrylic acid and its esters which are polymerized to form methacrylate resins.

Phosphoric Acid Shows Promise as Soil Stabilizer

Recent studies have revealed that 1-10% by weight of phosphoric acid stabilizes the fine-grained soils which must frequently be used as foundations for roads, dams and airstrips, and improves the ability of these soils to bear loads. Until these studies were made, no really satisfactory means had been found for solidifying fine-grained soils, which have strength when dry but not when wet.

Phosphoric acid seems to act by forming an insoluble phosphate glass from particles of alumina and silica in the soil. It can be employed in low concentrations, costs little, works fairly rapidly. Soils cured for a few hours under humid conditions achieve high strengths after several days, and very high strengths after a few weeks.

Depending on the initial water content of the soil being treated, it may be necessary to add small amounts of other materials such as fluosilicates for faster cure and maximum wet strength of the stabilized soil.

★ U.S.I. CHEMICAL NEWS ★

CONTINUED

Automation

This new automation is proving invaluable to company and customers alike. When a customer needs some special product or rush service, the U.S.I. salesman, relieved of detail by the automated communications system, is free to set an all-out effort in motion to deliver what the customer needs when it's needed.

Switching center at Cincinnati. Here order and message tapes are received from sales offices for redirection to New York headquarters and shipping points throughout the country.

Esters of Alkyl Aryl Phosphoric Acid Cut Static on Polyethylene

Polyethylene articles with a greatly reduced tendency to accumulate electrostatic charges can be made by incorporating certain esters of alkyl aryl phosphoric acid, according to the claims in a recent British patent. In addition, on polyethylene film and sheeting, these esters are said to reduce static without increasing slip or wettability, as do certain nonionic surfactants used for the purpose. They do not affect the flexibility, water and chemical resistance, strength or heat-sealability of the resin in any way, it is asserted.

The ester is uniformly distributed on the surface of the polyethylene in one of two ways. It may be thinly coated onto the surface of the finished article from solution in a volatile solvent, in the amount of 5 to 100 mg/sq. yd. of surface; or it may be incorporated into the granular resin by milling before fabrication, in the amount of 0.05 to 0.25% by weight.

The resulting articles exhibit little or no static, even after prolonged application of friction, according to the patent, and can be surface-treated by usual methods for better bonding with printing inks.

"Atoms-for-Peace" Show Great Success at Geneva

Mallory-Sharon Among Exhibitors

The U.S. Atomic Energy Commission and 50 U.S. industrial firms participated in the commercial exhibition held September 1-14 at the Palais Des Expositions, Geneva, Switzerland in conjunction with the second United Nations International Atoms for Peace Conference.

Focal point of the American section of the exhibition was a full-scale model of the core of a 150,000 KW atomic power plant. A rotunda surrounding the model contained an information center and displays telling the overall story of the U.S. atomic industry. On either side of the rotunda were the exhibits of the 50 participating U.S. companies.

Objectives of the American exhibition were twofold: First, to demonstrate that U.S. industry and government are working co-operatively in the field of atomic energy. Second, to show that in the U.S. atomic energy is a practical reality.

Highlights of the American section were two "live" atomic reactors of the research and training type; a completely equipped, mobile radioisotope laboratory; the showing of atomic energy films; a display of U.S. technical publications; and a new "master slave" robot.

Mallory-Sharon Metals Corporation, Niles, Ohio — world's largest integrated producer of reactive metals — was one of the principal exhibitors at the show. The company, owned one-third by U.S.I.'s parent company National Distillers and Chemical Corp., devoted its display to zirconium for structural and cladding purposes in thermal reactors and to hafnium for control rods.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

Ethanol as a nutrient for cattle, dairy animals and sheep is discussed in a 4-page reprint now available. The alcohol is reported to accelerate rumen microflora metabolism, increasing protein synthesis and cellulose digestion. **No. 1400**

Diethylene glycol dimethyl ether described in new technical bulletin as anhydrous reaction medium for organometallic reactions, solvent for inorganic salts, and for use in synthesis of organoboranes and boron-nitrogen polymers. **No. 1401**

Technical reports made on polyethylene from 1929 to 1957, and now available from the Office of Technical Services of the Dept. of Commerce, are all listed in a 4-page catalog available from Govt. Printing Office for 10¢. **No. 1402**

Copper complex fungicide now offered in pilot plant quantities may also serve as rodenticide. Field tests indicate effectiveness on wide variety of harmful organisms in concentrations between 0.005 and 0.05 per cent. **No. 1403**

Corrosion-resistant metallic filters for fuels and other compounds such as hydrogen peroxide, hydrazine, ethylene oxide and liquid oxygen can now be obtained. Wide range of flow rates and mesh sizes available. **No. 1404**

C^{14}-Labeled isooctane (2,2,4-trimethylpentane-2,4-C^{14}) is now available for hydrocarbon and petroleum research on combustion, and for kinetic and mechanical studies. Specific activities to 5 millicuries/millimole can be made. **No. 1405**

New all-polyethylene acid pump now on the market attaches to any 5-pint reagent bottle. Consists of pump body with relief valve, siphon, spout and 4-ounce squeeze bottle. Claimed to deliver 1,000 milliliters per minute. **No. 1406**

Ion exchange resins are discussed in recently up-dated book which can now be purchased. In 466 pages, the book provides detailed information on the nature and preparation of all types of ion exchange resinous materials. **No. 1407**

New silicone rubber compound, reported to be toughest 25 durometer material now available, is suggested for molded and extruded seals, low pressure gaskets, cushions, other parts. Offers tensile strengths up to 1,000 psi. **No. 1408**

New optical goniometer identifies crystalline substances by simple external measurements of interfacial angles. Catches reflections from various faces in telescope moved around crystal. Claimed accurate, easy to operate. **No. 1409**

PRODUCTS OF U.S.I.

Alcohols: Ethyl (pure and all denatured formulas); Proprietary Denatured Alcohol Solvents SOLOX®, FILMEX®, ANSOL® M, ANSOL PR.

Organic Solvents and Intermediates: Normal Butyl Alcohol, Amyl Alcohol, Fusel Oil, Ethyl Acetate, Normal Butyl Acetate, Diethyl Carbonate, DIATOL®, Diethyl Oxalate, Ethyl Ether, Acetone, Acetoacetanilide, Acetoacet-Ortho-Chloranilide, Acetoacet-Ortho-Toluidide, Ethyl Acetoacetate, Ethyl Benzoylacetate, Ethyl Chloroformate, Ethylene, Ethyl Sodium Oxalacetate, Sodium Ethylate, ISOSEBACIC® Acid, Sebacic Acid, Urethan U.S.P. (Ethyl Carbamate), Riboflavin U.S.P., Pelargonic Acid, 2-Ethyl Heptanoic Acid.

Pharmaceutical Products: DL-Methionine, N-Acetyl-DL-Methionine, Urethan USP, Riboflavin USP, Intermediates.

Heavy Chemicals: Anhydrous Ammonia, Ammonium Nitrate, Nitric Acid, Nitrogen Fertilizer Solutions, Phosphatic Fertilizer Solution, Sulfuric Acid, Caustic Soda, Chlorine, Metallic Sodium, Sodium Peroxide, Sodium Sulfite, Sodium Sulfate.

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Executive Training

From page 27

each major department and of the various Shell subsidiaries discuss their operations and methods of management. The sessions are designed to provoke discussion by both instructors and students.

Discussions are led by specialists in management techniques, outstanding economists, government officials, and business executives. In preparation for all discussions the participants spend several hours each evening in discussion and study of reading assignments.

Top Management Benefits

Summing up the results of the weeks of intensive work, H.S.M. Burns, president of Shell Oil Company, says: "I am not sure who gains the most from this experience — the instructors or the students. Certainly every man who participates, teacher or student, is called on to examine himself and his work most carefully. The conscientious and able executive cannot help but gain from such an experience."

Stimulates Students

Among the evaluations of the course given by the participants is one remark. "I am physically numb and mentally refreshed. The sudden switch from the demands of routine operations to a period of several weeks in which to think, talk, and gripe in the abstract is an opportunity seldom possible because of the pressures of everyday business."

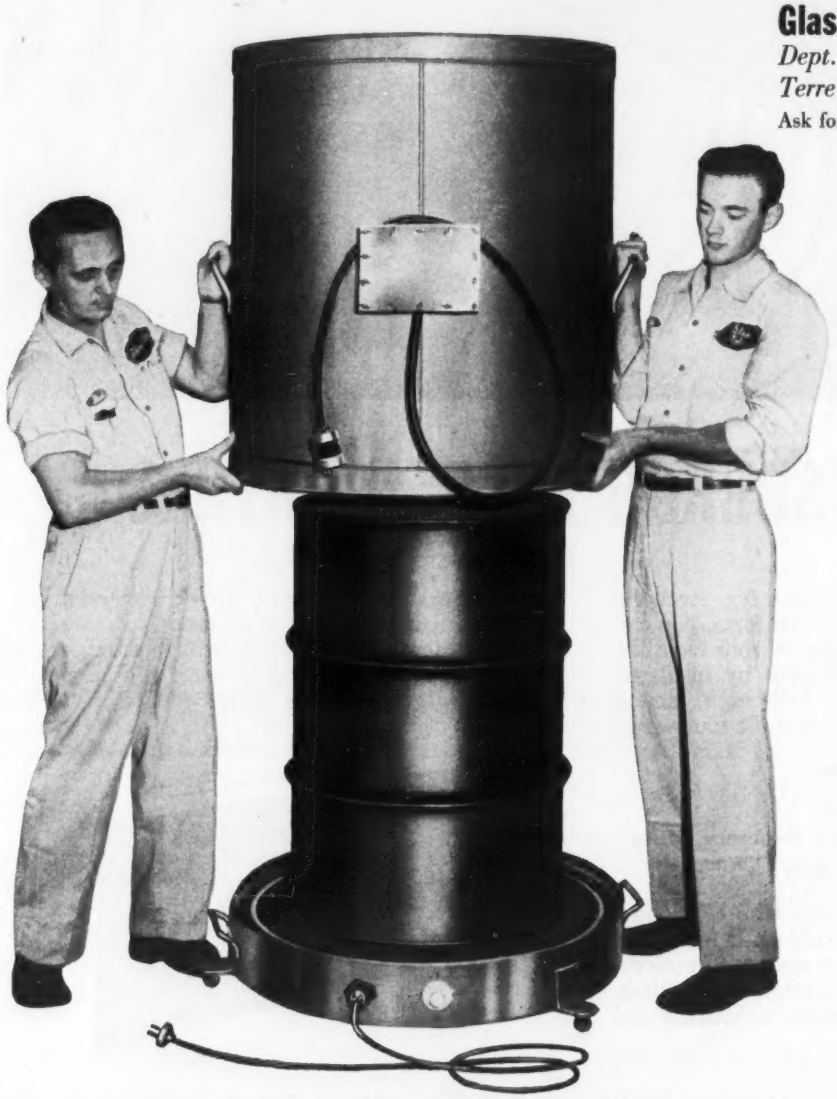
Another summed up his reactions this way: "This has been one of the most satisfying experiences I have had with Shell. I feel certain this opportunity to learn the philosophy of our top management cannot help but make me a better manager in the future."

But Shell makes one point clear. Training on the job still continues as the primary

For more information on product at left, specify 2285 . . . see information request blank opposite last page.

FOR CONTROLLED HEATING OF | tars, asphalts, heavy oils, greases, paints, varnishes, pitches, resins, plastics, shortening, gelatinous materials . . .

Here's the NEW MODEL Glas-Col Complete Drum Heater. To use, place drum on heater base. Lower cylindrical part of heater down over the drum. Put cover on. Hook up the two leads. Cover, cylindrical and base unit completely enclose drum . . heating is rapid, safe. Heating elements, imbedded in rugged fabric, are close together. This insures uniform input . . no local overheating. Separate thermostats in base and cylindrical part of heater permit accurately controlled heating to 550° F. Rugged casters make loaded unit easily portable. Base part of heater (1800 w, 230 v), **$200** . . cylindrical part (6000 w, 230 v), **$340** f.o.b., Terre Haute, Ind. | (When ordering, please specify outer diameter of drum chimes. Base or cylindrical unit can be ordered separately.)



Glas-Col Apparatus Company
Dept. CP, 711 Hulman Street
Terre Haute, Indiana
Ask for 4-page descriptive bulletin DH-100.

Check 2286 opposite last page

Order PITTSBURGH MOLTEN PHTHALIC!

IF YOUR plant has facilities for receiving phthalic anhydride in molten form, you can make a substantial reduction in your handling and processing costs. Delivered by insulated tank truck or tank car, *Pittsburgh* molten phthalic can save you money these four ways:

1. Lower cost per pound.
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Quality-controlled at every step of production, *Pittsburgh* Phthalic Anhydride maintains good molten color stability over long periods, and requires no special alloy steels for handling. It is essentially free of maleic anhydride and benzoic acid, thus assuring uniform reaction rates and reducing product variations.

Let us know about *your* P.A. problems today. *A call or wire will place an experienced Pittsburgh Industrial Chemicals man at your service!*

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COKE & CHEMICAL CO.

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COAL CHEMICALS • PLASTICIZERS • PROTECTIVE COATINGS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

Check 2287 opposite last page

Executive Training

From preceding page

method of helping Shell people develop themselves to handle more responsible jobs. President Burns mentions: "No matter what form of training aids are offered, promotions will always be made from performance on the job. That is where a man finally must develop and prove himself."

We're Building Now

From page 31

'Underlying growth trends point to expansion'

Union Carbide Corporation — in February of this year, Union Carbide Corporation announced that it was going ahead as planned with the expansion of its production facilities. Expenditures for 1958 will amount to approximately $150 million. This figure is well over the average spent on new construction over the last 12-year period.

This green light for new construction came after a re-evaluation of the present and future growth possibilities of Union Carbide's product lines and the prevailing economic conditions. The conclusions reached by Union Carbide management were based upon the conviction that the economy was undergoing a short-term fluctuation — one which should be measured in months rather than years.

The strong underlying

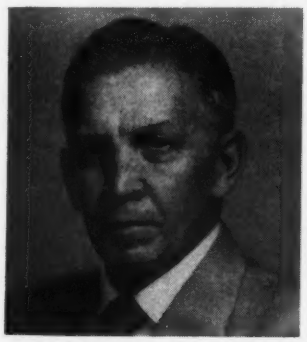
NEXT MONTH

Expansion by acquiring foreign know-how has been a favored route during recent years. A spectacular example is the Ziegler low-pressure polyethylene process, now a seasoned transatlantic traveler. Next month, internationally known engineers Ralph Landau and Thomas P. Brown of Scientific Design Company discuss pros and cons of acquiring know-how from foreign sources.

growth trends continue to point to an expanding economy. These growth factors are particularly evident in the chemicals and plastics industries where increasing demand for products is tied closely to the growing per capita consumption of goods.

'Faster construction on recent projects'

F. M. Anable, Vice President, Victor Chemical Works — This is a good time to build chemical plants and to replace old ones that are wearing out. Most construction materials and equipment are now available on much shorter delivery than during the past several years, and contractors — both engineering and construction — are eager to keep their staffs busy. We believe con-



F. M. Anable

struction costs are certainly not greater now than they will be in another year or two, and probably they are less.

Building just to be building should be avoided, however, in order that the chemical industry may not get its production facilities too far ahead of consumption. While consumption will inevitably increase in the years to come, this increase may take time; and in the meantime, there would be needless pressure on prices if the industry builds too quickly.

Victor has just completed construction of one entirely new plant on the Pacific Coast, a new organic phos-

No wasting of engineering manhours on details . . . no need to exchange drawings with scattered suppliers with Link-Belt handling your belt conveyor installation. You get all equipment from one source . . . the specialization that only industry's most comprehensive line of idlers—plus pulleys, drives, terminal machinery and auxiliary equipment—can offer. From design through erection, Link-Belt takes on total responsibility. Our nearest office has full information. 14.780

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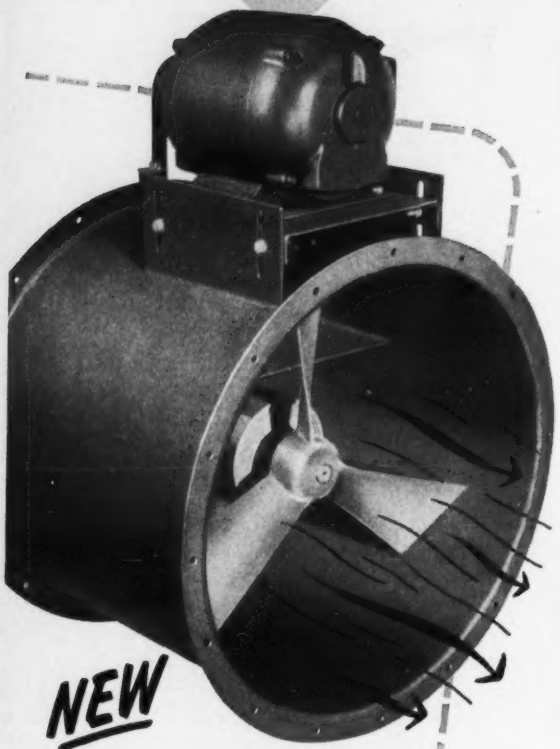

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PROPELLAIR®
belt driven Tubeaxial Fans

Type "BT" Propellair Fans can be purchased and operated at low cost to handle difficult atmospheres such as highly corrosive, explosive, inflammable, grease or dust-laden air. Straight-line design permits easy, inexpensive installation. Platforms and duct elbows are eliminated. The externally mounted Robbins & Myers motor, sealed cast iron housed bearing assembly, air-tight drum and belt-tube provide complete protection. Standard models can handle temperatures up to 450° F. Propellair "BT" tubeaxial fans are available in sizes 16" to 60" for from 2000 to 85000 CFM air delivery.

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MOVING AIR IS OUR BUSINESS

Check 2289 opposite last page

We're Building Now

From preceding page

phorus compounds plant in Tennessee, and the replacement of our oldest electric furnace for producing phosphorus. All three projects were completed in very good time, and construction was faster than for many years back.

We have a new phosphorus pentasulfide plant on the drawing board, and construction will be commenced shortly at Morrisville, Pennsylvania. We have a new unit of our research laboratories under construction in Chicago Heights.

'Could never build similar facilities for less'

Frank Wolcott, Vice President and General Manager, Research and Engineering Division, Wyandotte Chemicals Corporation — We have not changed our plans for present or future expansion, primarily because we have faith in

Frank Wolcott

the long-range growth of the economy and in the continued growth of the chemical industry and the demand for its products.

Another reason we are continuing our present construction program as scheduled is because we are convinced that we could never build similar facilities for less money than at the present time. We see no clear signs of a break in the wage-price spiral.

We are presently in the midst of a major expansion

Longer Valve Life with Colmonoy Hard-Facing

Catalyst slide valve gates, throats, and bodies last up to five times longer when hard-faced with Colmonoy No. 1 electrodes. The success of Colmonoy No. 1 in resisting erosion by catalytic fluids has made it the standard material for hard-facing slide valves by many maintenance shops, job shops, and valve manufacturers.

Colmonoy No. 1 electrodes have a new metallic coating that improves arc stability, permits vertical welding, and eliminates weld cleaning between successive passes. This reduces welding time to cut the already low cost of reclaiming valves with Colmonoy hard-facing.

Two 8 inch slides and throats after being reclaimed with Colmonoy No. 1 (shown finish ground)

A valve slide being hard-faced with Colmonoy No. 1 electrodes.

Write for Colmonoy Hard-Facing Manual #79 for more about Colmonoy hard-facing alloys and methods.

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Check 2290 opposite last page

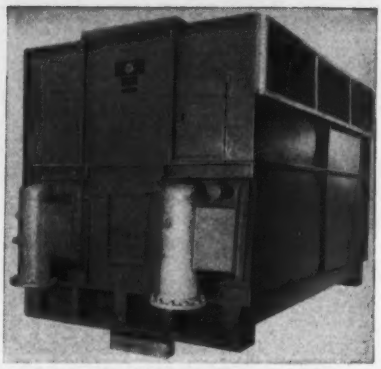
REDUCE OPERATING COST of VACUUM SYSTEMS with this "AERO" (air-cooled) VAPOR CONDENSER

With free air the cooling medium, you use the least water, evaporated in the air stream. You save the cost and pumping of large volumes of condensing water.

Air-vapor subcooling reduces mixture evacuated from the system, saving in the operation of steam ejector or vacuum pump.

This air-cooled condenser gives you more capacity than other types at a substantial saving of steam and power. Water supply, scaling treatment and disposal problems are eliminated.

You get pure condensate, an improved product; often profit by recovery of residues now wasted. There can be no contamination of your product at any time; it never touches raw water. Condensing, of water, of solvents or of your product, is simplified; you have one, compact, easily maintained unit replacing both cooling tower and barometric or surface type condenser.



Niagara Aero Vapor Condenser Panel Casing construction gives access to all parts, saves first costs in shipping and installation.

Maintenance expense is low. Niagara Aero Vapor Condenser Panel Casing construction gives access to all parts, saves first costs in shipping and installation. Summer-winter dampers and Balanced Wet Bulb Control provide precise, year 'round adjustment of capacity to load.

Constant temperature, uniform products and maximum production 12 months a year are assured. Capacities up to 15 million BTU/hr.

Write for full information. Ask for Bulletin 129R

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Check 2291 opposite last page

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for FILTRATION STRAINING DISTRIBUTION DISPERSION

Strong—rigid—requires little support or reinforcement. Can be formed into panels, discs, plates, cylinders, cones. Not injured by scraping, flushing or blowback. Does not clog or blind. Made in stainless steel, Monel, aluminum, Carpenter 20 steel.

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- Centrifugals

Write for Bulletin 582

MULTI-METAL WIRE CLOTH CO., INC.
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Check 2292 opposite last page

and construction program which should be completed during 1959. Following this, we expect to continue on our long-range program for expansion and diversification at a more normal annual rate of expenditure.

Understanding Creativity

From page 32

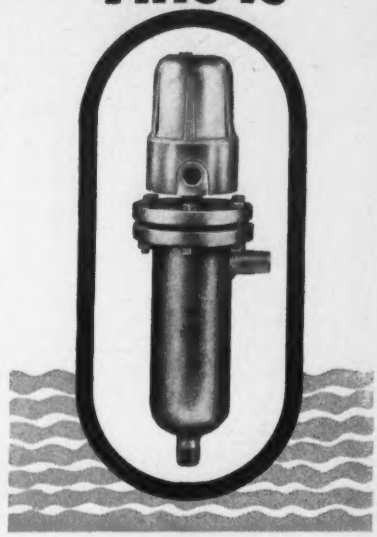
results of true creativity? . . . Nowhere to be found. *But the most important thing has been accomplished; everyone is working smoothly as a group!*

The truly creative man really needs no supervision. Once given a problem to solve, he pushes himself to the limit of his endurance. Constant, harrassing supervision, in this case, can only lead to one end. Either the creative man goes sterile and quits in spirit, or he quits physically and removes himself from his harrassers, looking and hoping for freedom.

Why is it so difficult to understand that creative people need quiet and freedom? They need their pathways made smoother by intelligent cooperation, instead of demands that they conform and cooperate with blind supervision. To

"They're sending you to Research and me to Development — I wonder why?"

This is



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Send full information on Level Master and name of nearest representative.

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Company_____

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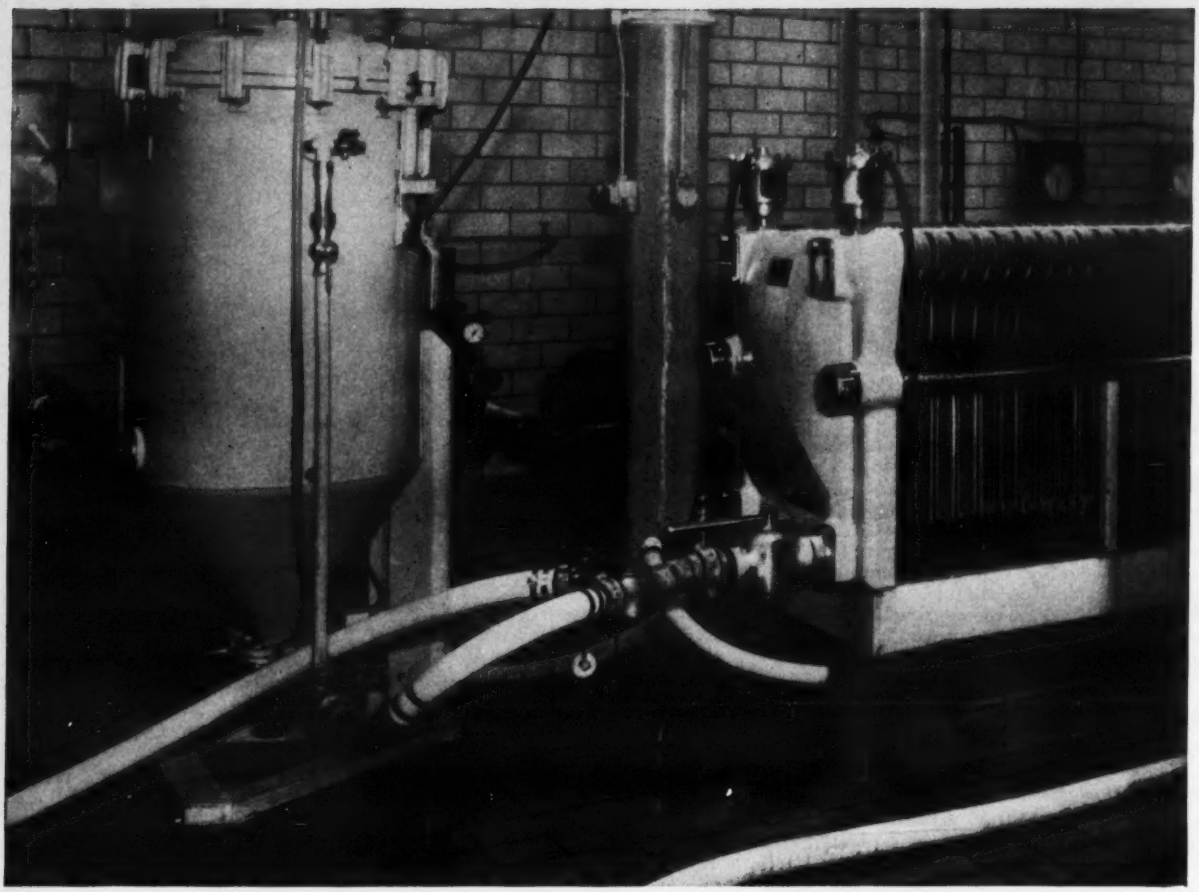
Check 2293 opposite last page



Where There's R/M ENGINEERED HOSE

There's "More Use ~~per~~ *for Your* Dollar"

R/M makes long-lasting rubber hose for every application in the chemical industry. For general air and water service, Homoflex is light, strong, and flexible as a rope . . . reduces cost through easy handling and long life. Special constructions are available for acids, chlorine, solvents, oil and contaminating chemicals. Condor Acid Hose, for example, can handle practically all inorganic acids and salts up to 150° F.

Special burst-resisting types with flexible wire for high pressure air and steam provide longer, safer service. If you have corrosion, wear, or expansion problems with metal pipe installations, Condor Flexible Rubber Pipe outlasts iron or steel . . . is easier, more economical to install. R/M also makes Teflon*-lined rubber hose for complete resistance to most active corrosive and contaminating solutions.

Ask your R/M representative to tell you about other rubber hose constructions for your specific operations. He'll show you how R/M engineered hose will do a better job, longer . . . give you "More Use per Dollar" on every job.

*A DuPont trademark.

RMB33

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Check 2294 opposite last page

Understanding Creativity

From preceding page

demand conformity is to frustrate creativeness.

Many really good men with really good ideas were, and are, stopped or made sterile by a supervisor's lack of understanding of what a new idea means to a creative person. *A truly creative person who is honest with himself will not, and cannot, take ignorant, unintelligent, blind, misdirection.* Supervision of research today is too often just that.

The result is that many of the best creative people, our best minds, are now working at mediocre jobs out of preference. This is not only because they have to eat, but mainly because in a mediocre job the creative person can do work under conditions that will not crush his creative spirit.

Lithium Recovery

From page 33

ters 22-ft diam by 13-ft high flotation chamber. Pressure is released, solution effervesces, and a myriad of fine air bubbles escapes from solution. Bubbles trap the lithium product and float it to the surface.

Retention tank (right) has 1500 gal capacity, provides necessary time and agitation for dissolution of air. Solution stays in tank about 2 minutes

Product is scraped off top and deaerated for further processing.

Pressure control valve can be set at any desired pressure, depending upon flow rate required. In this unit it is held at 90 psi. Flow of liquor through the complete recovery

system varies from 300 to 900 gpm. Recycling the effluent from the launders back to the pump provides an even flow through the flotation separator of approximately 1000 gpm.

The only froth control agent used in the process is ordinary stove oil. This acts as a modifier and prevents foam from becoming too voluminous. The oil also aids filtration later in the process.

Results: Since its installation 18 months ago, the flotation separator has boosted lithium concentrate recovery 11%. Maintenance on the unit has been low, and there have been no equipment failures since initial startup. The flotation chamber is drained about twice a year to wash out Glauber's salt accumulation in the bottom.

No extra manpower is needed to operate the separator. In fact, unit has reduced amount of work for existing personnel by making overall recovery system more flexible.

(Further information about lithium chemicals may be obtained from American Potash & Chemical Corporation, 3000 West Sixth Street, Los Angeles 54, California.)

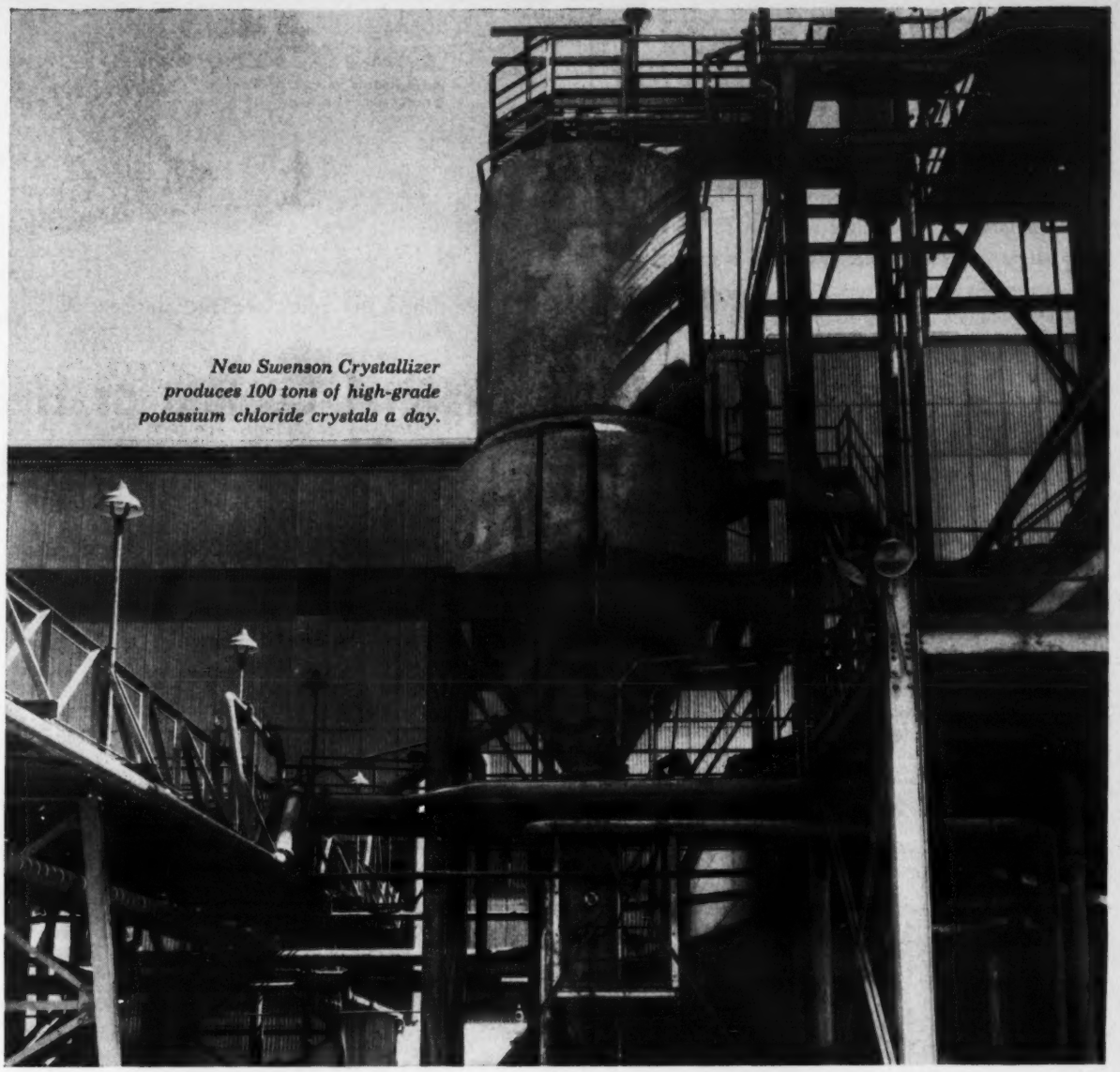
Check 2295 opposite last page.

(Pacific Flotation Separators are product of Pacific Industrial Engineering, Inc., Security Building, Pasadena 1, Cal.)

Check 2296 opposite last page.

'Float' skyscraper on lead

When completed, the 52-story Union Carbide Building in New York City will be "floating on lead". As an antivibration move, each of the 115 supporting steel columns rests on lead pads. Pads are designed to isolate building from heavy rail traffic passing directly underneath on its way to Grand Central Station. (*Lead*, Lead Industries Association)



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cp **IDEAS:** from other industries and nuclear field — new trends in research, processes, services

W. A. THOMAS

Here's how to calculate the degree of . . .

Natural Cooling or Heating of Tanks While Being Emptied or Filled

W. A. THOMAS
Engineering Consultant
Brighton Corporation
Cincinnati, Ohio

When a body such as a tank of liquid is left standing to cool naturally, it is customary to apply Newton's die-away law to find the temperature at any time. This well-known formula works easily to a straight-forward solution provided that the dimensions of the cooling body do not also change with time.

However, problems commonly occur where the dimensions do change with time, e.g., when a tank is being emptied while cooling. These problems are complicated by the fact that while the temperature changes at one rate, the volume changes at another rate, and the surface at still another rate. Three different rates are involved instead of one.

The writer, not finding solutions to these cases in the literature, has developed the method described here.

Let v be the initial volume, in cu ft, of liquid in the tank. Then, for a constant rate of pumping out — p cfh — the volume of liquid remaining in the tank at any time t hr will be: Eq. 1) $V = v - pt$.

Let s be the initial total heat transfer surface (sq ft) of the liquid. Then the total liquid surface will be reduced q sq ft/hr, and the total surface at any time t hr will be: Eq. 2) $S = s - qt$.

Let:

- a = mean ambient temperature, °F, surrounding the liquid. Assumed constant
- b = initial temperature of liquid, °F
- B = temperature of liquid, °F, at any time t hr
- U = mean coefficient of heat transfer, Btu per sq ft per hr per °F
- c = specific heat of liquid = 1.0 for water
- w = specific weight of liquid, lb/cu ft = 62.4 for water
- m = U/cw
- e = base of natural logarithms = 2.718

The liquid undergoes Newtonian cooling for which the differential equation is:

$$\frac{dB}{dt} - \frac{U}{cw}\,\frac{S}{v}\,(B-a) = 0 \qquad \text{(Eq. 3)}$$

In the cases we are considering, the volume V and surface S vary with time t as given by Eq. 1 and 2, so we put these equations into Eq. 3. Also, since U, c, and w are constants, we adopt the new constant, m = U/cw, and put it into Eq. 3, which gives:

$$\frac{dB}{dt} + m\,\frac{s-qt}{v-pt}\,(B-a) = 0 \qquad \text{(Eq. 4)}$$

We integrate this equation to find the temperature B at any time t. The reader is spared the details of the many steps. The result is:

$$\mathrm{Ln}(B-a) = -m\left[-\frac{s}{p}\,\mathrm{Ln}(V-pt) - \frac{qv}{p^2} + \frac{qt}{p} + \frac{qv}{p^2}\,\mathrm{Ln}(V-pt)\right] + C \qquad \text{(Eq. 5)}$$

The constant of integration C must be such that, from the initial conditions, when t = O, B = b. Therefore, put t = O and B = b in Eq. 5, and get:

$$C = \mathrm{Ln}(b-a) + m\left(-\frac{s}{p}\,\mathrm{Ln}v - \frac{qv}{p^2} + \frac{qv}{p^2}\,\mathrm{Ln}v\right) \qquad \text{(Eq. 6)}$$

Putting Eq. 6 into Eq. 5 and, skimming blithely over the algebraic trans-

positions and sand traps, we finally cook up the desired formula:

$$B = (b-a)e^{-M} + b \qquad \text{where}$$

$$M = m\left[\left(\text{Ln}\frac{v}{v-pt}\right)\left(\frac{s}{p} - \frac{qv}{p^2}\right) + \frac{qt}{p}\right] \qquad \text{(Eq. 7)}$$

It has the same form as Newton's integrated equation for fixed dimensions except that the exponent M contains more terms. The use of Eq. 7 is illustrated by the following two examples.

Example 1

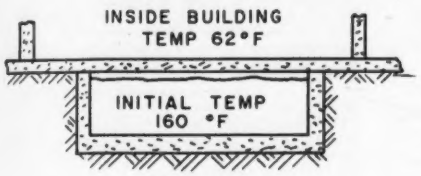


Figure 1

An underground square concrete tank, 40 × 40 × 12 ft deep (Fig 1), is filled to 11 ft with 40 × 40 × 11 ft = 17,600 cu ft (v) of water at initial temperature of 160°F (b). Ambient temperature surrounding tank is 62°F (a).

Water is then pumped out to the 1 ft level at rate of 2 cfm = 60 × 2 = 120 cfh = p. Volume at any time t hr is V = v − pt = 17,600 − 120t. Water level falls at rate of 120/(40 × 40) = 0.075 ft/hr. Level will be 1 ft at (11−1)/0.075 = 133 hr.

Total heat transfer surface of water is: top (40 × 40 = 1600 sq ft) + bottom (40 × 40 = 1600 sq ft) + sides (4 × 40 × 11 = 1760 sq ft) = 4960 sq ft = s.

Total surface at t hr will be S = s − qt = 4960 − (0.075 × 4 × 40 × t) = 4960 − 12t, and q = 12.

Total liquid surface at any time t is:

Top (contact with air) =
40 x 40 = 1600 sq ft constant = 1600
Bottom (contact with conc.) =
40 x 40 = 1600 sq ft constant = 1600
Sides (contact with conc.) =
(4 x 40 x 11) − 12 ft/hr = 1760 − 12t

Then S = 4960 and s = 4960 − 12t sq ft

Mean heat transfer coefficient is approximately:

Top (liquid to air) =		
	1600 sq ft @ U = 0.6 =	960
Bottom (liquid to conc.) =		
	1600 sq ft @ U = 0.2 =	320
Sides (mean liq. to conc.) =		
	1760/2 = 880 sq ft @ U = 0.3 =	264
	4080 sq ft	1544

Therefore, mean U = 1544/4080 = 0.37 Btu per sq ft per hr per °F, and m = U/cw = 0.37/(1.0 × 62.4) = 0.00593.

We now use Eq. 7 to find the temperature of the liquid at t = 133 hr.

$$M = -0.00593\left[\left(\text{Ln}\frac{17{,}600}{17{,}600 - 120\times133}\right)\times\left(\frac{4960}{120} - \frac{12\times17{,}600}{120^2}\right) + \frac{12\times133}{120}\right] = 0.46$$

and

$$B = (160-62)2.718^{-0.46} + 0.62 = 121\ °F$$

Answer

In the same way we get for t = 100 hr: B = 132°F. We continue using other values of t and plot the curve in Fig 3 (solid line).

Example 2

A circular steel tank on ground outdoors, 35 ft diam and 21 ft high (Fig 2). Other conditions the same as in Example 1, capacity approximately the same.

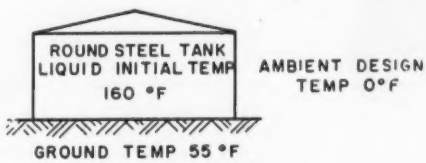


Figure 2

Calculations similar to those in Example 1 give: v = 19,200 cu ft, b = 160°F, a = 13°F (see calculations below), p = 120 cfh, V = 19,200−120t; water level falls at rate of 120/(0.7854 × 35²) = 0.125 ft/hr. Level will be 1 ft at (20−1)/0.125 = 152 hr.

Total heat transfer surface of the water is: top (0.7854 × 35² = 960 sq ft) + bottom (0.7854 × 35² = 960 sq ft) + side (π × 35 × 20 = 2200 sq ft) = 4120 sq ft = s. Total surface at t hr will be S = s−qt = 4120−(0.125 × π × 35t) = 4120−13.8t: q = 13.8.

Mean ambient temperature is found by area temperature moments:

Top	960 sq ft x 0°F =	0
Side	2200 sq ft x 55°F =	52,800
Bottom	960 sq ft x 0°F =	0
	4120 sq ft	52,800

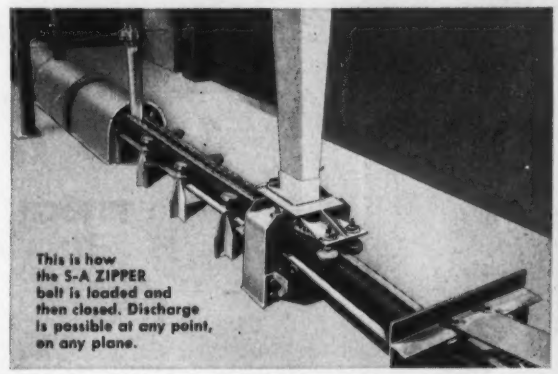
Then, mean ambient temperature = 52,800/4120 = 13°F = a.

Mean heat transfer coefficient is approximately:

Top (liquid to air) =		
	960 sq ft @ U = 2.0 =	1920
Side (liquid to air) =		
	2200 sq ft @ U = 2.0 =	4400
Bottom (liquid to ground) =		
	960 sq ft @ U = 0.2 =	192
	4120 sq ft	6512

To next page

FRAGILE BULK MATERIALS ARE HANDLED GENTLY AND SAFELY by "ZIPPER" CLOSED-BELT CONVEYORS-ELEVATORS


This is how the S-A ZIPPER belt is loaded and then closed. Discharge is possible at any point, on any plane.

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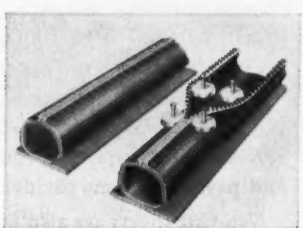
For additional information write for Bulletin 349.


Section view thru endless ZIPPER belt shows how load is completely enclosed. Belt is spread, meshed and locked by rollers.

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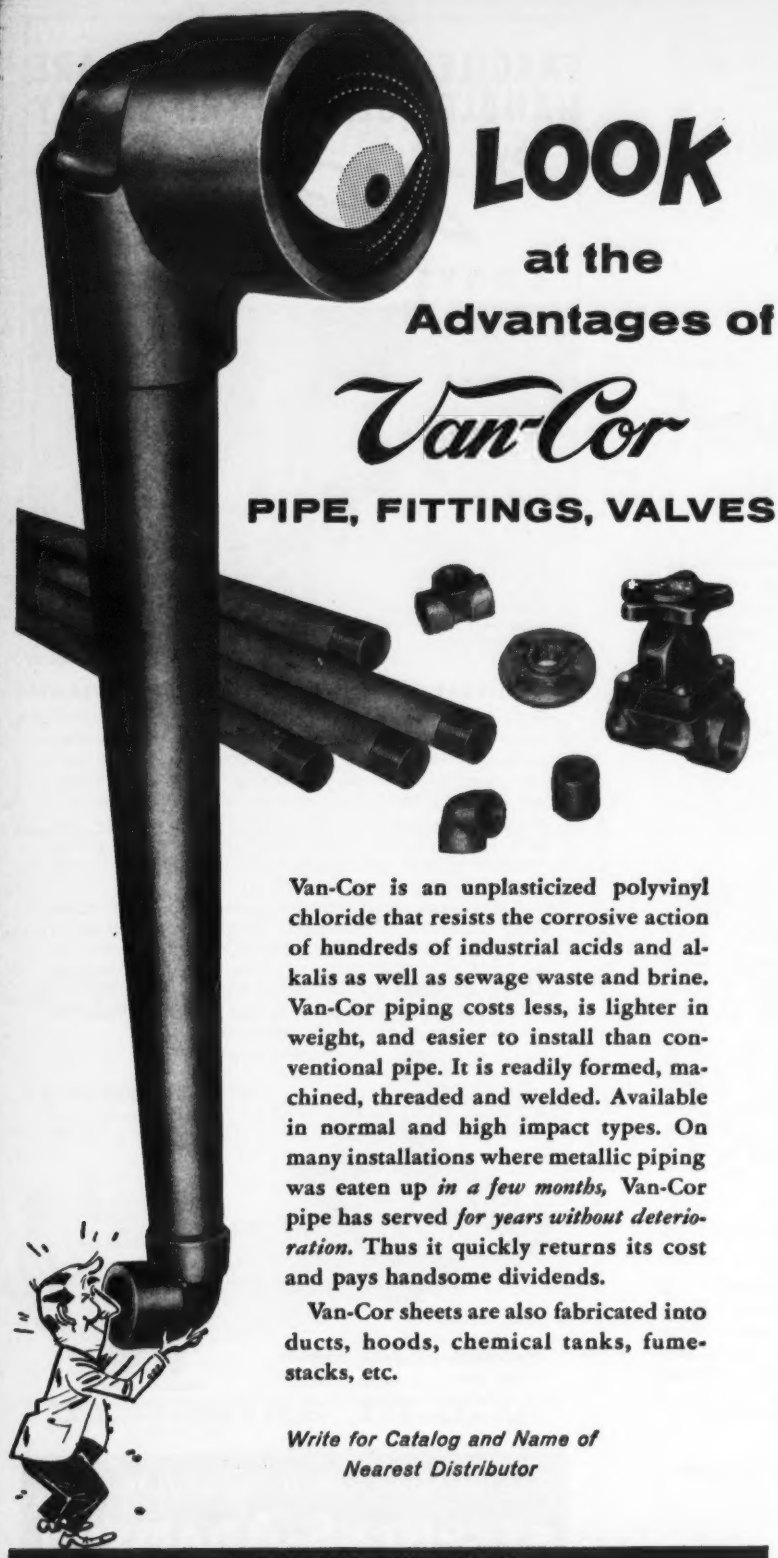

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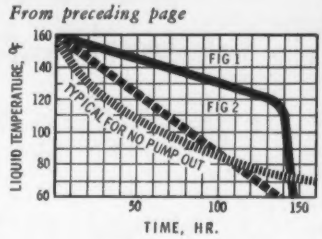

Figure 3

Mean transfer coefficient = 6512/4120 = 1.58 Btu per sq ft per hr per °F. Therefore, m = U/cw = 1.58/(1.0 × 62.4) = 0.025.

Now, using Eq. 7 as in Example 1, we calculate temperatures, using several values of t (three equispaced values should be enough) and plot the curve in Fig 3 (broken line).

If the tank is insulated, U is the only value that must be changed. The resulting curve of course would give higher temperatures.

Eq. 7 may also be used for tanks being heated while being filled.

Research radiation studies help boost quality of gasoline

Use of nuclear radiation to develop improved grade of gasoline has been successfully completed at Esso Standard Oil Company. Product is now in full scale production. The radiation studies were part of a 3½ year project conducted by the firm's research lab (see CHEMICAL PROCESSING, Dec. 1957, page 107). Tests cost about $750,000.

Use of radiation accomplished what the company described as being an almost hopeless task. The research tool helped to identify and "tag" those hydrocarbons that do not burn cleanly and cause deposits in engines. Techniques were then developed to use ultraviolet light equipment in refineries to detect the harmful hydrocarbons so they could be removed.

(Information courtesy of Esso Standard Oil Company, 15 West 51st Street, New York 19, New York.)

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Depending upon grade of product to be made, varying but exact amounts of chrome ore, high-calcium pebbled lime, and a metallic reducing agent to smelt the ore must be combined during milling and smelting operations.

Plant uses two grinding mills, each for a specific mixture. From 10 giant storage bins, ingredients must be selected, withdrawn, weighed, and fed through system of screw conveyors, natural-frequency carriers, and elevators to the mills.

From mills, inclined screw conveyors take mixtures to receiving surge hoppers and another series of proportioning and weighing operations are performed. Here, vibrating feeders deliver material into compartment-type, 20,000-lb batching hoppers which are lifted by overhead crane into position above furnace. Material is then fed into furnace for smelting.

In addition to precise control necessary over weighing and proportioning, a system of interlocks was necessary to assure that certain basic ingredients could not be mixed together by accident.

Solution: To meet precise control requirements for weighing from the 10 storage bins, eight automatic bulk weighing, totally-enclosed scales were installed. One of these services three bins holding an acid ingredient. Remaining seven bins each have own scale.

Material is delivered from bins to scales by a vibrating feeder. Feeder controllers are mounted at scale locations so that individual adjustments

can be quickly made.

Each scale inlet has a pneumatically-operated and brush-sealed radial gate which opens to permit material to flow to weigh hopper. Hopper is suspended from one end of a very-low-ratio one-piece scale beam. At other end are counter-weights and indicator to show balance on test weighings.

Upon completion of weighing, beam actuates limit switch which causes inlet gate to close instantly, interrupting flow of material from supply in bin above. Each scale is also equipped with a subsidiary beam for weighing fractional amounts (¼-1 lb) within range specified.

The seven scales handling the individual bins have a bifurcated bottom hopper, each side of which delivers to one of the collecting line screw conveyors which feeds each of the mills. Each seale has a three-position selector switch reading Mix "A"-"Out"-Mix "B". Diverter action is manual, and system is so interlocked that when any scale is selected for mix "A" its diverter must have been properly positioned before system functions.

A common control panel houses necessary relaying equipment for the eight scales. Two separate tonnage controllers are used, one for each line, since mix "A" and mix "B" lines operate at different rates. Interlocks assure that all scales are automatically checked to insure that they are ready to discharge, and also to determine that they have discharged before it is possible to start a new feed cycle. Discharge of scales is interlocked with operation of respective collecting line screws.

Weighing and Proportioning for Smelting Operation

Similar scales were installed for weighing material going into furnaces. Plant has three scales for weighing amounts of mix "A", "B", and high-calcium pebbled lime. Each has subsidiary beams and receives product from several bins through individual vibrating feeders.

To page 113

this **flanged "T"**

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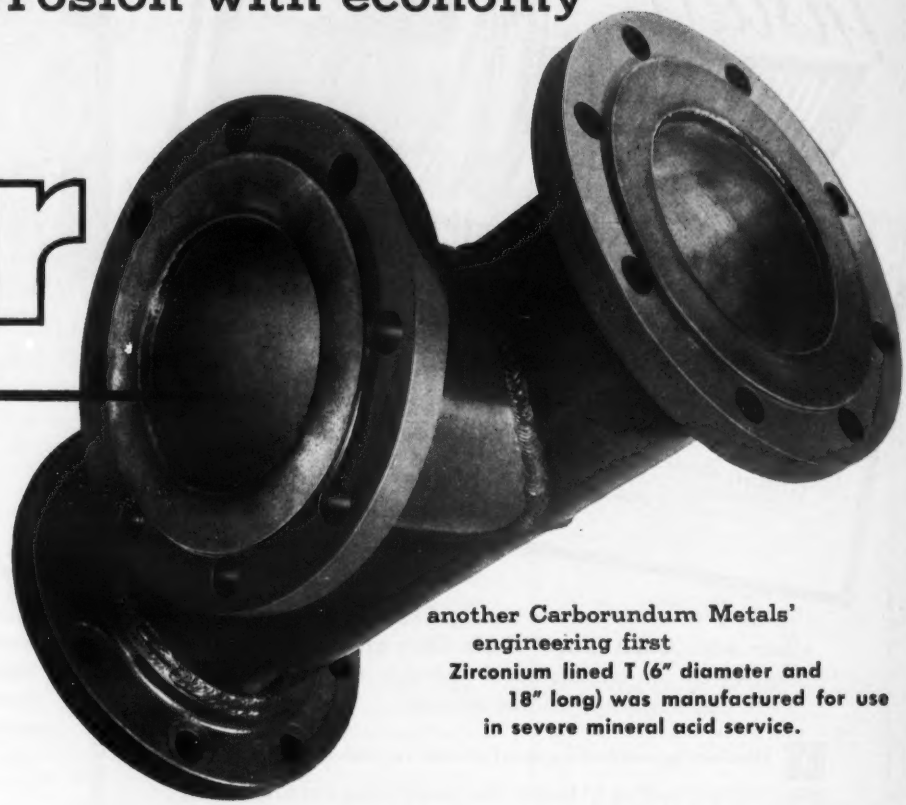

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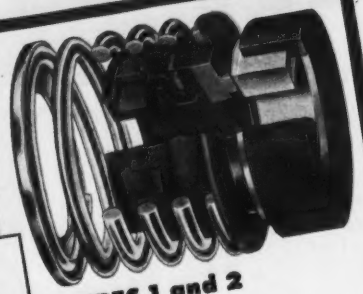

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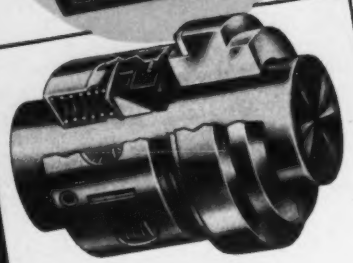

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There is no better way to cut liquid handling costs than with "John Crane" Seals. They are specially engineered for the Chemical Industry to provide these important operational savings:

1. **Eliminating loss of expensive and corrosive fluids.**
2. **Positive sealing of toxics, thus minimizing need for costly exhaust equipment.**
3. **Substantially reduced maintenance and the man-hours involved.**
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Ranging from the Types 1 and 2 (for services where synthetic rubber is suitable) to the Type 9 (with sealing members made of DuPont Teflon to handle any industrial chemical or corrosive)... there is a "John Crane" Seal that can be adapted to your individual conditions.

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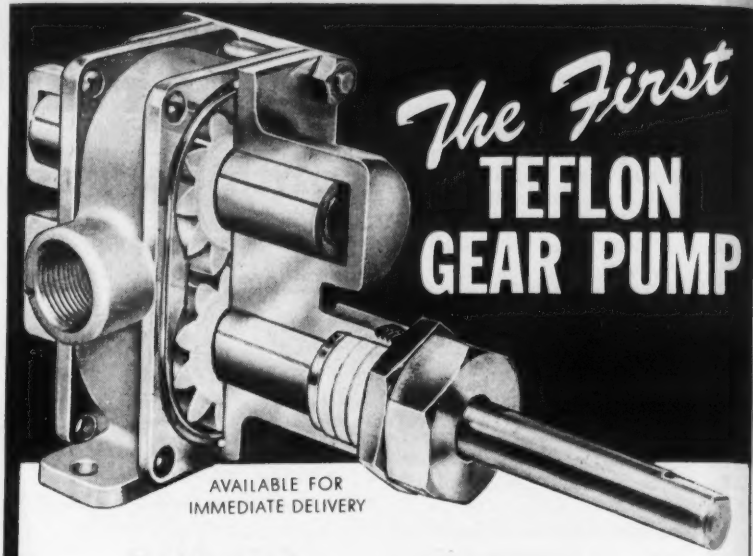
Crane Packing Co., 6421 Oakton St., Morton Grove, Illinois (Chicago Suburb).
In Canada: Crane Packing Co., Ltd., Hamilton, Ont.

John Crane **CRANE PACKING COMPANY**

Check 2305 opposite last page



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FOR NON-LUBRICATING AND CORROSIVE FLUIDS

You asked for it...

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***Designated the GearChem**, **this pump is suitable for speeds to 1750 rpm at capacities to 10 gpm and pressures to 100 psi. Viscous media to 5000 SSU can be pumped at reduced speeds.**

***The GearChem** **created tremendous interest at the recent Chemical Show. In addition to proportioning and metering applications the pump is ideal for general process work in pilot plant and production operations.**

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* T.M. Applied For

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Check 2306 opposite last page

Automatic Weighing

From page 111

Mix "A" scale is fitted with a flush-governing vane feeder for feeding material into low-capacity top hopper. This is necessary to prevent dangerous flushing of the material. A 10-cu-ft volume between feeder and low-level switch serves to deaerate the fine mixture and permit it to settle. To prevent very fine material from leaking through scale discharge door, an air-operated flushproof door and mechanism is used.

Vane feeder is controlled by level of mix "A" in top hopper. Scale will not weigh unless level of material has actuated low-level switch. Also, feeder will start only when level of material drops below low-level switch. It will continue to run until high-level switch stops feeder.

The three scales load the 20,000-lb batch buckets which are used for charging the furnaces. A keyed lock-out switch in control panel prevents lime from being discharged into same batch bucket with mix "A". Wall-mounted control box contains microflex stop counter circuits to determine amounts of material to be delivered, the scales discharging at will. It also contains "power on", "batch running", and "batch completed" lights with "in-out" selector switch for each scale.

Each of the furnace scales has a "test-run" selector, as well as controller for feeder for compensation correction.

Results: In operation for over a year, the automatic weighing system has over 99% accuracy handling loads exceeding 25 tons per hour. System assures precise quality control in the tonnage production of ferro-chromium.

A single operator at central control station can accurately direct complete processing from storage to furnace. Possibilities of human error have just about been eliminated.

(E-50 automatic bulk weighing scales were furnished by Richardson Scale Co., Clifton, New Jersey.)

Check 2307 opposite last page.

Emery NEWS

WEIGHING SYSTEM

BIN, TANK AND HOPPER EDITION No. 10

Covering design, development and application data on Emery Weighing Systems for industrial applications.

ANNOUNCING THE NEW WAY-PAC* LINE OF LOW-CAPACITY LOW-PRICE PACKAGED SYSTEMS FOR TANK WEIGHING

SIMPLICITY OF SELECTION AND OPERATION IS KEY FEATURE OF SUPPLEMENTARY LINE

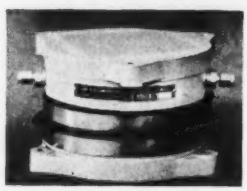

FIG. 1 TYPE AC-1 CELL COMPRESSION.

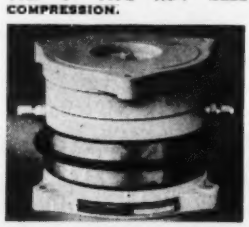

FIG. 2 TYPE AC-1 "ROLLING-BALL" CELL.

FIG. 3 TYPE AD-1 CELL DYNAMOMETER.

FIG. 4 TYPE AT-1 CELL TENSION.

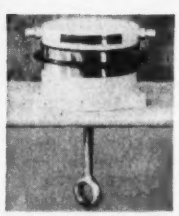

FIG. 5 TYPE AU-1 CELL TENSION.

The WAY-PAC, a new line of Emery low-capacity, low price packaged hydraulic tank weighing systems, designed specifically for the 0 to 1000 lb. range, is now being offered to the process industries.

The accuracy of the WAY-PAC cells is ¼ of 1% of range. This extreme accuracy depends upon two significant design features . . . a moulded rubber diaphragm which maintains a constant acting area and a rolling ball assembly which performs the dual function of practically eliminating friction in the "piston-cylinder" assembly as well as preventing deleterious pinching of the diaphragm in the event of cross loading.

Five different cell types are available in the WAY-PAC line, each designed to perform with typical Emery excellence under different sets of operating conditions. (See Figs. 1 to 5).

The cells are manufactured of aluminum and a top grade bar stock steel to eliminate any possible leakage of the film of oil sealed in the diaphragm.

Unique design features, coupled with the ultimate in manufacturing craftsmanship, have produced in the WAY-PAC line equipment capable of long service life with extreme accuracy under the most rigorous conditions.

A complete line of related equipment is available including: tank pivots, strut assemblies, indicators and recorders. Although controlling and printing equipment can be supplied with and can be operated from the WAY-PAC cells, it is desirable that our engineers know the details of the installation in order to make a recommendation.

*Trademark

Moulded Rubber Diaphragm Gives Constant Acting Area

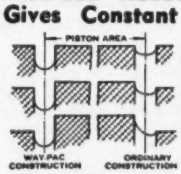

FIG. 7

The moulded rubber diaphragm used in the WAY-PAC cells possesses a unique "rolling action" which imparts constant acting area to the cell. This "rolling action" is illustrated in Fig. 7.

Because of this constant "rolling action", the Emery WAY-PAC load cell is extremely and consistently accurate.

Exclusive "Rolling Ball" Head Available in WAY-PAC LINE

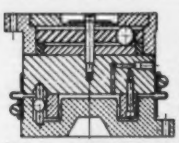

FIG. 6 CROSS SECTION OF "ROLLING-BALL" CELL.

To prevent damage from possible crosswise movement of the tank, bin, hopper or structure being weighed, we have incorporated into the WAY-PAC cell line the exclusive Emery "rolling ball" head.

In essence, the WAY-PAC "rolling ball" head consists of three ½" diameter stainless steel balls built into the top platen of the cell, riding top and bottom on hardened steel plates. (See Fig. 6). In operation, any crosswise movement, such as that incurred in the expansion and contraction of the structure being weighed, rides on the stainless steel balls and is transmitted through them to the diaphragm.

Load cells which do not take expansion and contraction into consideration are not properly designed and cannot compare with the WAY-PAC.

NEW WAY-PAC BULLETIN 582 AVAILABLE FOR DISTRIBUTION

Our new Bulletin 582 which describes in detail the Emery WAY-PAC line and provides an easy-to-use method of figuring your system costs is now off the press. Send for your copy right away.

PRECISION SINCE 1872

THE A. H. EMERY COMPANY

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Check 2308 opposite last page

STUMBLING HAZARD ELIMINATED

Spilled materials on a solid walkway caused workmen to stumble and turn ankles. Installation of 80% open Irving Mesh Grating allowed materials to fall through and minimized the hazard.

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Check 2309 opposite last page

IDEAS

Highly resistant sealant cures at room temp, hardly shrinks

A polysulfide liquid polymer base sealing compound, used extensively in sealing fuel tanks and pressurized cabins of jet aircraft, is expected to find many industrial uses. Sealant is highly resistant to liquids such as alcohol, lubricating oils, hydraulic fluids, and water at temperatures from −65 to 275°F.

Liquid rubber sealant cures at room temperature to firm resiliency; is highly resistant to various liquids

The material is supplied in two consistencies: Class A can be applied with brush; Class B, a thixotropic or non-sag consistency, can be applied with an extrusion or injection gun on vertical or overhead seams. Sealant cures at room temperature to a firm, resilient rubber with a minimum of shrinkage.

(PR-1422 sealant is manufactured by Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif.)

Check 2310 opposite last page.

Film and card system of engineering data control is presented in a step-by-step explanation in illustrated 16-page bulletin. "The Filmsort Aperture Card for Your Engineering Drawings and Allied Records" — The Filmsort Co., Div. of Miehle-Goss-Dexter, Inc., Pearl River, N.Y.

Check 2311 opposite last page.

NEW answer to CORROSION and SAFE fume handling

new SUPER/AIR-VAN®

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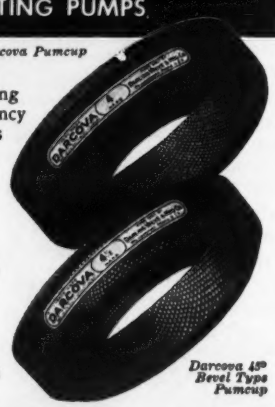
Check 2312 opposite last page

DARCOVA PUMCUPS
now available with
100% NYLON COMPOSITION
for HYDRAULIC CONTROLS, AIR CYLINDERS, RECIPROCATING PUMPS

Darcova Pumcup



Darcova 45° Bevel Type Pumcup

DARCOVA PUMCUPS—long noted for unequalled efficiency and life in all kinds of cylinders—are now greatly exceeding their own performance records! The new 100% Nylon Composition, available *only* in Darcova Pumcups, does it!

Nylon Pumcups are made in sizes, types and textures exactly right for your particular equipment—ready *now* to give you unprecedented piston packing performance!

Write for helpful data Bulletin No. 5503.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.

DARCOVA
TRADE MARK
PUMCUPS

Check 2313 opposite last page

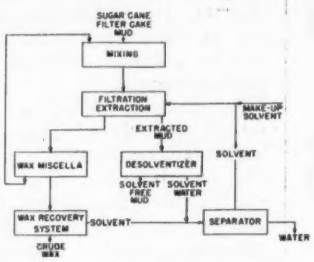
To get more information on products—use the Reader Service slip . . . *opposite last page*

Process extracts 83-85% wax from cane

May find practical use in small U.S. mills

Sugarcane growers may soon have another source of income thanks to the development of a low-cost process for extracting wax from cane. Developed by US Department of Agriculture, process is a modification of another technique developed for extracting oil from cottonseed and other oilseeds.

The wax recovery process has been tested only on a small scale. Large-scale studies are needed before it will be ready for commercial use. Preliminary results indicate that



Filtration-extraction process produces crude wax from sugarcane mud

method will be practical for use in small- and medium-sized sugar mills in this country. Another process has been in use in Cuba, but it is adaptable only to large mills.

The new wax-extraction process consists of slurrying heavy impure residue of cane juice with hot heptane, then extracting wax by combination of filtration, evaporation, and stripping.

Extraction efficiencies of 83-85% have been obtained in laboratory studies — much higher than the 70% for process used in Cuba. Analyses of crude wax produced from "as is" mud showed 44.2% wax, 40% oil, and 15.8% resins, which are comparable to those for commercially produced crude sugarcane wax. Sugarcane muds subjected to process have mass velocities as high as 5900 lb/hr/sq ft.

The US annually imports more than 20 million lb of vegetable waxes worth about $10 million. The hard wax obtainable from sugarcane is similar to carnauba wax, which constitutes about ¾ of our vegetable wax imports.

(Further information about wax recovery process may be obtained from US Department of Agriculture, Southern Utilization Research & Development Division, P.O. Box 7307, New Orleans 19, La.)

Pilot plant started to produce paper from bagasse

Will test practicability of building mill in Hawaii

Research is being stepped up to determine commercial feasibility of using bagasse as raw material for paper manufacturing in Hawaiian Islands.

Pilot plant, storage, and auxiliary facilities are being completed to test whether it would be economically practical to construct a paper mill in Hawaii which would use about 75,000 tons bagasse per year. Studies are being conducted in Camas, Washington, and in Hawaii.

Approximately 1000 tons of depithed bagasse are to be shipped to Camas from Hawaii for further refining and manufacture into paper. It takes about a ton of bagasse to make ½ ton paper.

Hawaii produces 1 million tons of bagasse annually. About 5% is used to make wallboard and the rest is burned as fuel in sugar mills.

(Research project is joint undertaking of Hawaiian Sugar Planters' Association, Honolulu, Hawaii, and Crown Zellerbach Corporation, 343 Sansome Street, San Francisco, California.)

Laboratory facilities available to industry for mixing problems are described in six-page bulletin. Pilot-plant mixing operations of hazardous-materials laboratory are outlined, and uses of continuous multi-stage contactor are discussed. Bul B-516 — Mixing Equipment Co., Inc., 158 Mt. Read Blvd., Rochester, N. Y.

Check 2314 opposite last page.

How Textile Mills

PREVENT REJECTS

with Neptune Liquid Meters

"Rejects" in weaving dropped way down when Cannon Mills installed Neptune Auto-Stop meters to measure the *exact* amount of water into the warp size mix. Warp size is a mixture of starch, tallow and water. If it's too thick the starch "balls up" on the warp; too thin and the warp is too limp.

Uniformity of warp size was so improved when the first meter replaced the inaccurate dip-stick that *additional* Neptunes were installed throughout all Cannon Mills for warp size control.

Most common liquids are now being measured by Neptune meters... hot or cold water, oils, syrups, brines, soap solutions, chemicals... in hundreds of plants.

Available with Auto-Stop feature to deliver preset quantity of liquid; with Auto-Switch to operate pumps, valves, etc.; and with Print-O-Meter register to give a dispute-free record of each batch. Capacities: 2 to 1000 gpm. in bronze; 20 to 100 gpm. in stainless steel. Send for Meter Application Bulletin 566-AP

GET THE FACTS
Ask for helpful Meter Data Bulletin 566 AP See Neptune Data Pages in Chemical Engineering Catalog.

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Check 2315 opposite last page

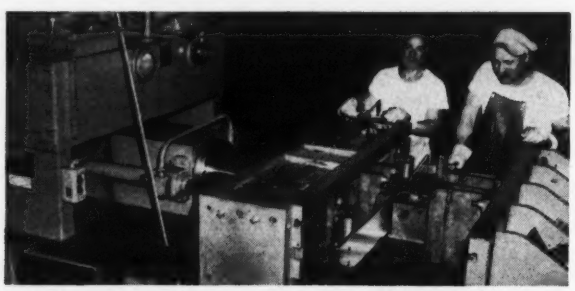
LOW VOLTAGE BUS

Overhead view of 45,000 amp a-c bus feeding bank of graphitizing furnaces at Stackpole Carbon Company. Bus is interleaved to reduce reactance drop. Insulation is Transite.

FIRST-CLASS AVENUES FOR YOUR AMPERES

R&IE's broad experience in low voltage bus design and fabrication—for electrochemical and electrothermal processes—means high current distribution systems that are easier to install, longer lasting, and trouble-free. And, by supplying a fully detailed set of assembly and installation drawings with each system, R&IE assures simpler, lower-cost future expansion.

Experienced R&IE bus design engineers are available to join in your early planning. Their knowledge can help reduce costs . . . improve system performance. They will determine the most suitable materials, protective finishes, bus size and configuration. Later they will provide sound solutions to design problems such as bus support spacing for maximum short circuit protection, provision for structural misalignment, and proper application of disconnecting switches.



Skilled workmen, using specialized machinery, produce bus components accurately and efficiently, assuring low production costs and fast, trial-and-error-free installation. R&IE shop personnel are thoroughly familiar with the fabrication of aluminum and copper. And they have at their disposal a full range of specially adapted tools and machinery for highly accurate cutting, punching, forming, welding and assembling bus, disconnecting switches and flexible bus connectors.

For complete information about R&IE's low voltage bus design and fabrication service, write for Bulletin 1220C, or contact your nearby I-T-E sales office. In Canada: Eastern Power Devices Ltd., Port Credit, Ont.

I-T-E CIRCUIT BREAKER COMPANY
R&IE EQUIPMENT DIVISION • GREENSBURG, PA.

Check 2316 opposite last page

IDEAS

Infrared long-path cells have up to 1600 meters effective path length

Measures concentrations of less than 1 ppm

Gas concentration measurements of less than 1 ppm are possible through use of a recently developed long-path cell for manufacturer's double-beam infrared spectrophotometers. When used in air pollution control studies, device can detect minute concentrations of ozone, carbon monoxide, and oxides of nitrogen or sulfide.

The twin cell uses a multiple-reflection principle which gives it a capability of 40 meters, or any smaller number divisible by 4. Effective path can be boosted up to 1600 meters by using an ordinate expansion system.

Applications include quantitative analysis of hydrocarbon mixtures, natural gas purity determination, free radical investigations, and high altitude studies. Use of an electronic ordinate expansion system with the cells makes it possible to detect gases in tenths of ppm.

(Further information about long-path cell for Model 21 double-beam infrared spectrophotometers may be obtained from Instrument Division, Perkin-Elmer Corporation, Norwalk, Connecticut.)

Check 2317 opposite last page.

Steel for "tinless cans" produced in Hammond coil stock plant

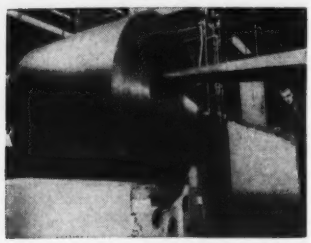
Installation can process up to 1.2 billion lb plate per yr

Recent opening of a new coil stock plant in Hammond, Indiana, marks a big step forward in the can industry's fight against rising prices and possible future shortages of tin. Plant is devoted exclusively to processing steel and tin plate for making metal containers. It has capacity to process up to 1.2 billion lb plate per year.

The installation is a big

change for the can industry. Up to less than a year ago all can makers received their basic raw material, tin plate, in finished form direct from steel mills.

The Hammond plant does not produce containers. It performs only two basic functions: 1) chemically coats steel



Huge roll of chemically treated steel plate comes off line ready to be sheared into plate for use in "tinless cans"

plate (black plate), 2) coils and shears both treated and tin plate into can-making sheets up to 36x36" in size.

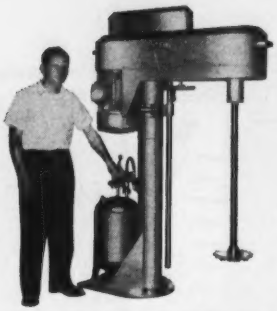
Plant is equipped with 9 shearing lines and 1 chemical treating line. Latter is said to be only one of its kind in the world. Plate is fed into line where it is cleaned, washed, chemically treated, and cured before being rewound into a coil for further processing. The treated plate is used to produce tinless cans.

Overall plant consists of about 325,000 sq ft of floor space. Annual output is rated at 600,000 tons processed plate.

(Coil stock plant was built by Canco Division, American Can Company, New York, New York.)

"Design for Progress", 32-page illustrated booklet, outlines engineering company's approach to design and construction of modern industrial installations. Copies may be obtained by letterhead request to **Dept.** C-3, Western Knapp Engineering Co., 650 Fifth St., San Francisco 7, Calif.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.



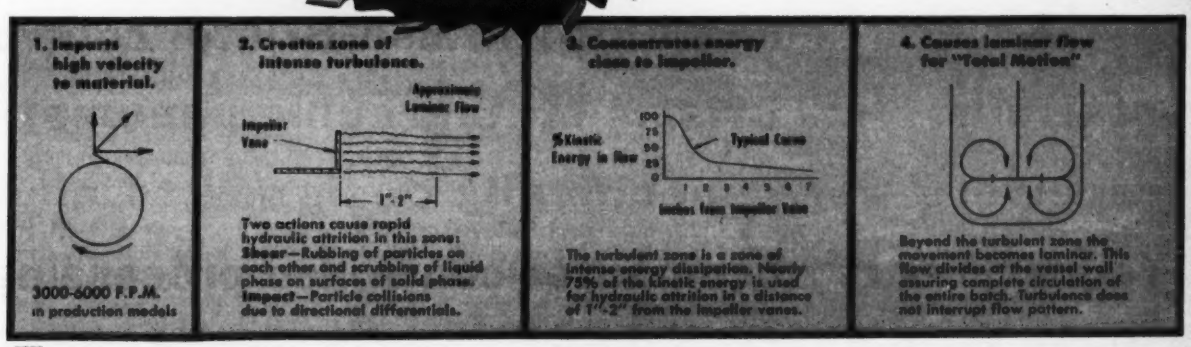
In the Cowles...

IT'S THE TEETH THAT MAKE THE DIFFERENCE

for greater mixing volume and quality

That's why the Cowles Dissolver is most in demand for ultimate dispersion, dissolving, emulsifying and deagglomerating—in processing solid-liquid, liquid-liquid and gas-liquid materials.

These teeth are an exclusive, patented feature of the Cowles Impeller. They set the Cowles far ahead of conventional mixers. Scientifically engineered power and drive systems insure complete control of the impeller action. The result is shown here in the steps that give you "MULTI-PHASE" mixing for greater volume and finer quality.



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The Cowles is adaptable to your materials, processes and present equipment. Cowles engineers will be happy to work with you in solving your processing problems economically. Their solutions are based on the industry's most advanced research. Let us prove it in your plant at our risk! Write today for complete information and catalog.

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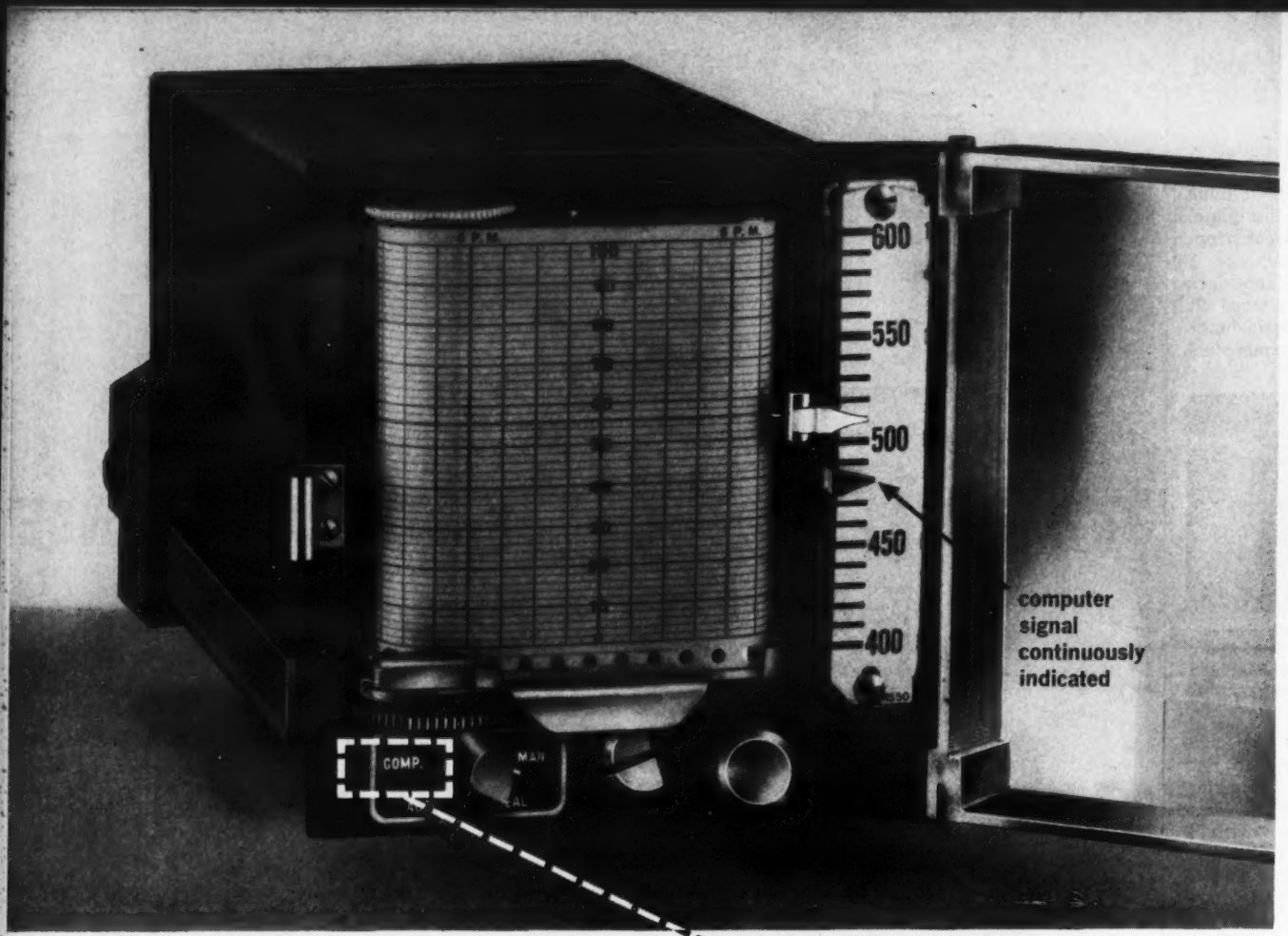
Check 2318 opposite last page

VOL 111 NOV 58 XUM



World's first computer-controlled petroleum refinery unit will use Bristol control stations. New Bristol Metagraphic pneumatic receivers were specifically designed to meet requirements of computer-controlled processing. Write for full information.

BRISTOL TRAIL-BLAZERS IN PROCESS AUTOMATION
AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS
141 Bristol Road, Waterbury 20, Connecticut

Check 2319 opposite last page

PROBLEMS?

Interested in solving them? Want to learn new ways of improving your plant operation and, thereby, realize savings?

In each . . .

issue of CHEMICAL PROCESSING there are articles that will help you solve many of your operational problems.

These "New Solution" stories appear in the "New Solutions" section which begins on page 42 of this issue.

This type of story is featured in other sections throughout the magazine.

They are case history stories that state the operating problem, explain how it was solved, and describe the results obtained.

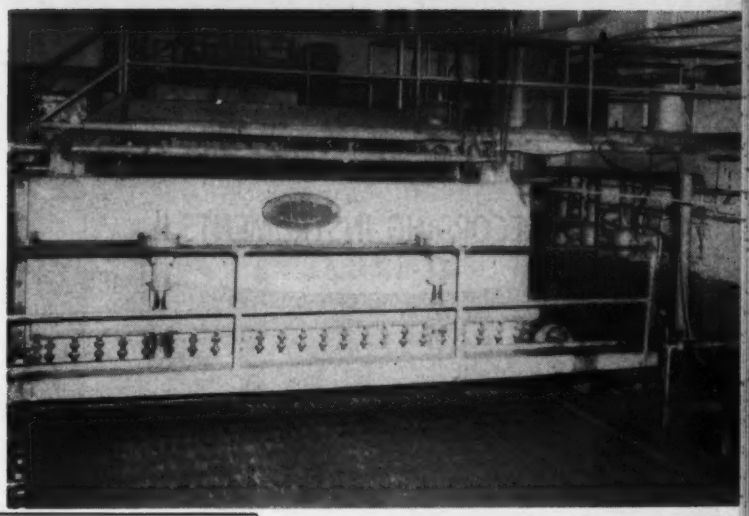
"New Solution" stories cover all important phases of your operations — processing, safety, maintenance, material handling, packaging, corrosion, to name a few.

This issue may contain the answer you need.

Two-element control system on feed to paper machine at Dryden Paper Company, Limited cuts costs and . . .

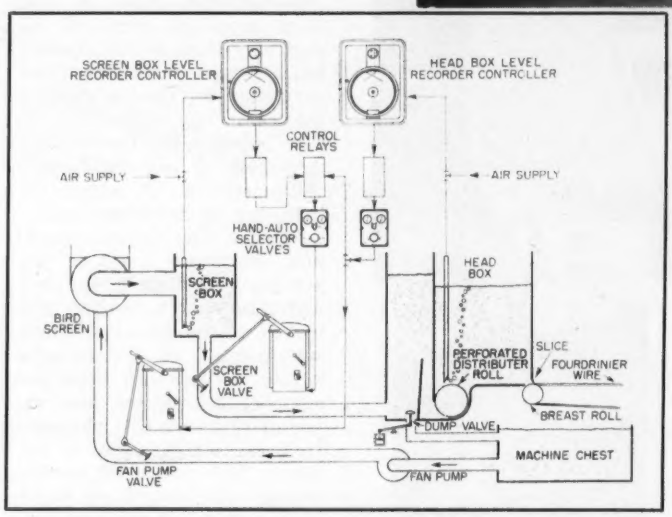
Achieves Exceptionally Uniform Paper

- **Reduces rejections**
- **Saves time in change-overs**

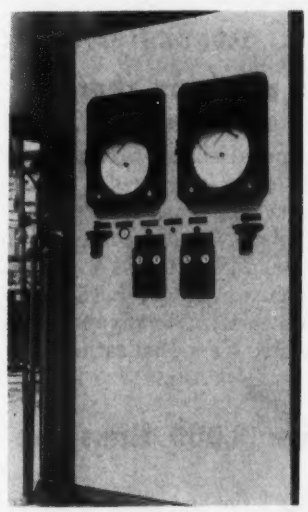


▲ Traveling at 1000 feet per minute, Fourdrinier wire (at bottom of photo) is receiving paper stock from head box at an even consistent flow rate. Change in control system not only permitted an increase in rate of papermaking, but improved uniformity of sheet produced

WILLIAM CLARKE, Associate Editor
with **D. MAUNSELL,** Manager
Dryden Paper Company, Limited
Dryden, Ontario



Simplified drawing of two-element control system on paper machine at Dryden Paper Company, Ltd. If head box level decreases, signal from head box level recorder-controller causes flow to screen box to increase. Flow from screen box to head box is simultaneously increased



Simple control panel for paper machine control system. Recorder-controllers contain set point adjustments. Selector valves permit manual or automatic control

Problem: Failure of head box to maintain proper paper stock level at wet end of speciality kraft paper machine at Dryden Paper Company, Ltd., caused sheet uniformity to vary considerably. In addition, whenever the paper machine was changed from one weight paper to another, much time and end product was lost during the change.

It is not at all uncommon for this specialty machine to produce many different weights of paper or board during a given 24-hour period. Designed to produce kraft products ranging upward from a 33 lb paper to a 140 lb board, machine output is controlled by rate of paper stock flowing to Fourdrinier wire. Any variation in rate of flow to the wire is instantly reflected in uniformity of sheet produced. The wire may travel at various speeds as requirements dictate.

Head box level was being controlled manually. By setting head box input equal to rate at which paper stock was being discharged onto the Fourdrinier wire, level was to be held constant.

Solution: At the time Dryden approached problem of automatically controlling head box level, this and other considerations indicated that major changes were necessary on the paper machine. A new head box was fabricated, a new slice and 20 new dryers were purchased. These changes permitted a machine speed-up to 1000 ft per min. Previously top speed had been 750 ft per min. Precise control of head box level became more vital now, since incorrect level could result in the loss of a great deal more paper.

At first a single element control system was considered. While it was felt that this might produce some improvement, it was also apparent that when the machine was changed from one weight paper to another, "hunting" would result.

Finally, a complete change of thinking as to how the instrumentation and control system should be installed on the feed stock suggested the single element control was too simplified for needs of the machine.

Discussion between mill personnel and an instrumentation engineer suggested use of a multi-element control system which anticipated any change in level of the head box. The new system was installed and tuned up on a Sunday. From that next Monday morning start-up several years ago, the system has worked satisfactorily in the manner as designed.

Operation of System

Operation of the two-element system is based on combining two level indicator signals so that any decrease in one level results in an instantaneous feed stock increase to reinstate the desired level. Thus the signal from the head box is combined with a signal from the screen box which

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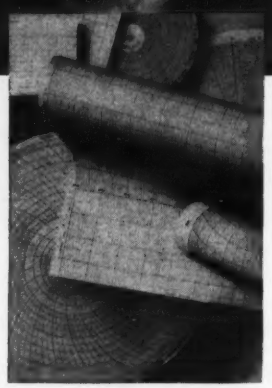

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Check 2320 opposite last page

supplies the head box with feed stock. Any level decrease in head box level thus causes the screen box to instantly replenish its supply of paper stock at the same time it begins to feed additional stock to the head box.

Two selector valves provide remote hand control of both levels. Two control drives containing positioning relays provide remote-controlled pneumatic power for precise positioning (and system stability) of screen box and fan pump valves.

Incidentally, one of the most important parts of the control system is the characterizing cam in the positioning relay. By merely shaping the cam, any differences in flow between the two butterfly valves, or any undesirable characteristics of either or both, can be smoothed out.

Results: The control system now maintains levels of paper stock in both screen box and head box to within $\pm 1/4$ inches of the pre-determined set points. A considerable saving in time has been accomplished over the previous installation when changing from one weight paper to another. Mill personnel merely change the control set point, letting the system automatically correct the head box level by the required amount. The screen box level remains constant although flow through the box will change according to demands made upon it.

And most important — exceptional uniformity of paper sheet has been accomplished. More uniform paper is being produced with much less spoilage.

(Multi-element control system is a product of Bailey Meter Company, 1050 Ivanhoe Road, Cleveland 10, Ohio.)

Check 2321 opposite last page.

Measuring microscopes, cathetometers, optical benches, and accessories to be used with each are listed and described in 28-page catalog. Microscope Cat — The Ealing Corporation, Box 91, Natick, Mass.

Check 2322 opposite last page.

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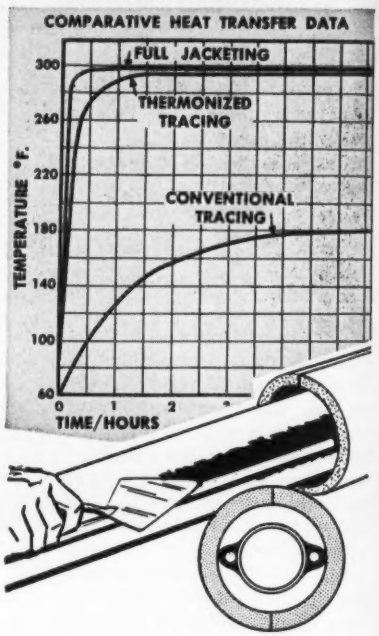

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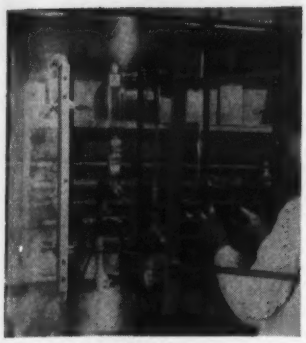

Safety shield . . .

. . . . designed for laboratory use is formed from ¼" thick sheet of acrylic plastic. Shield gives 180 degrees protection with wide-angle visibility. Shatter resistance affords protection against violent reactions, splashes from hot or corrosive liquids.

(Lab-Guard is product of Instruments for Industry & Research, 108 Franklin Avenue, Cheltenham, Pa.)

Check 2324 opposite last page.

Measures and delivers small quantities of heated fluids

Heating system of buret maintains 350°F heat

Uses: As buret for viscous or other fluids which must be handled at elevated temperatures, or as pump reservoir.

Features: Buret has heating system which will maintain a temperature up to 350°F.

Description: Instrument is housed in a metal case, and buret is enclosed in a glass cylinder for thermal insulation, and electrical and mechanical safety. Side panels of case are removable.

Special Pyrex-brand glass tubing graduated in ml is used as the buret. Heating is by a transparent conductive coating on outer surface of glass. Thus, an unobstructed view of graduations and contents is possible. Heating is controlled by a transformer mounted at top of apparatus.

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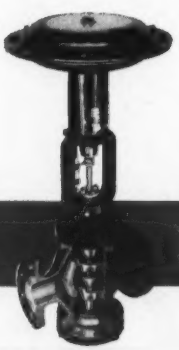

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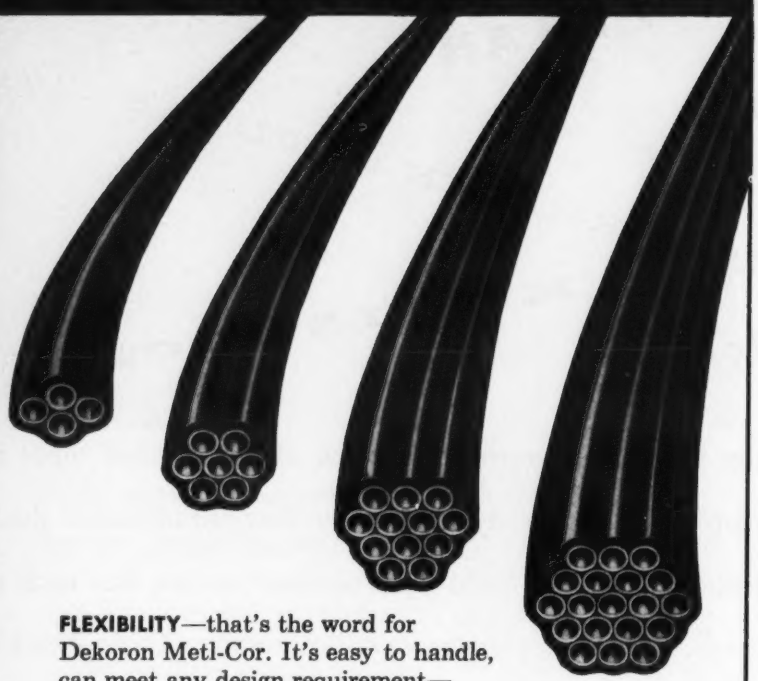
cuts installation costs
bends without distortion
solves instrument line corrosion problems



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Check 2326 opposite last page

with a standard ¼" pipe flange. Suitable adaptor permits use of any type stopcock, valve, or delivery device.

Two models of burets are available. One has capacity of 340 ml, the second of 820 ml.

(P.P.I. Thermette is product of Pressure Products Industries, Inc., Hatboro, Pa.)

Check 2327 opposite last page.

Tank level detector uses low radiation for control

Is installed completely external to tank

Uses: As liquid level detector and controller.

Features: Tank level detector-controller is installed completely external to tank, thus is completely free from fouling and readily accessible for maintenance.

Description: Radiation source is installed either opposite detector or across chord of tank. Instrument can furnish either of two modes of operation: to provide a relay closure signal when level raises above or falls below level of detector; to provide a high level and low level signal as required.

Source housing is designed to provide more than adequate shielding to reduce external radiation field below acceptable tolerances. Radiation field required for operation at detectors is only 0.2 mr/hour. Accuracies are to ±1/16". Instrument is available in explosion-proof models.

(AccuRay tank level detector-controller is product of Industrial Nucleonics Corporation, 1205 Chesapeake Avenue, Columbus 12, Ohio)

Check 2328 opposite last page.

Laboratory glassware featured in 20-page catalog. Line features leak-proof, freeze-proof stopcock that requires no grease. Cat 80C-100 — Fischer & Porter Company, 794 Jacksonville Rd., Hatboro, Pa.

Check 2329 opposite last page.

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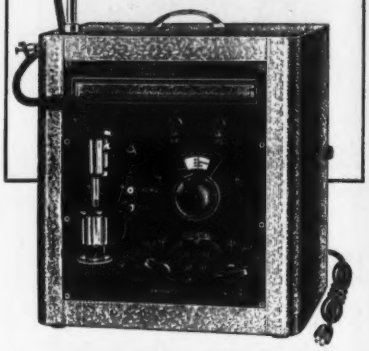

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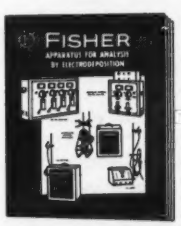

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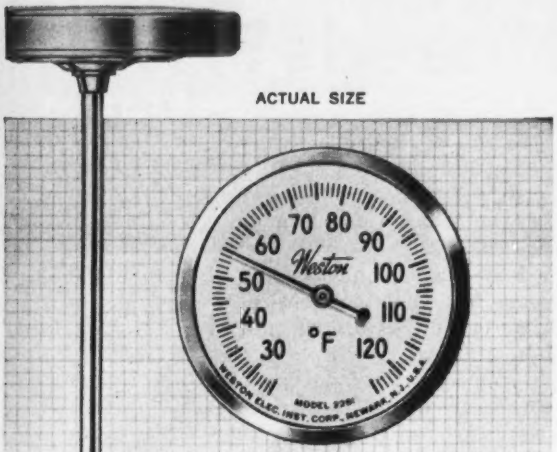

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Model 2261 Bimetals are

TOPS FOR TESTING

Here's the ideal thermometer for lab or industrial testing. It offers consistent accuracy in the face of general abuse. Like all Weston bimetals, its sensitive helical element is characterized by exceptional structural stability and fast, dependable thermal response. This results in excellent readability and assured accuracy within ½ of 1% of the full thermometer range. Except for the scale glass, Model 2261 is completely encased in stainless steel. 16 standard ranges are available covering the temperature spectrum from −100° to 500°F or −100° to 250°C. Weston also offers spike stem versions for food testing or internal oven use. Abnormal temperatures up to 50% over or under scale range will not impair the accuracy of Model 2261.

For further information, consult your local Weston representative, or write to Weston Instruments, Division of Daystrom, Inc., Newark 12, N. J., *In Canada: Daystrom Ltd., 840 Caledonia Rd., Toronto 10, Ont. Export: Daystrom Int'l., 100 Empire St., Newark 12, N. J.*

WESTON *Instruments*

A DAYSTROM UNIT

Check 2332 opposite last page

Automatic 'chemist' samples, analyzes, records data

Even washes pipets; other vessels

Uses: As automatic titrating "chemist", instrument will automatically handle Karl Fischer moisture tests, chemical assay of penicillin, uranium concentration in waste liquids, other complicated analyses.

Features: Auto-titration unit makes complete tests — samples, analyzes, records data — without human help.

Description: Instrument system is based on automation

Auto-titration analyzer testing amount of ethylene glycol in waste liquids

of unit operations in proper sequence and with appropriate parameters. System includes package assemblies previously in existence and others developed as needed. Step-wise development of instrument resulted from automation of a particular analysis until sufficient assemblies were developed to offer a general automating service.

Instrument system is custom built to individual requirements. Systems can be engineered from the simple to the very complex capable of handling a complicated assay.

(Analmatic analyzer is available from Chicago Apparatus Company, 1735 N. Ashland Ave., Chicago 22, Ill.)

Check 2333 opposite last page.

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R—Time Delay Relay	RMC—Automatic Reset	IT—Interval Timers
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LUMENITE ELECTRONIC CO.
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Check 2335 opposite last page

Testing a recently-designed multi-point potentiometer recorder. The instrument on top of the recorder simulates inputs for checking the printing operations

Readily changeable recorder with simple kit of interchangeable parts adapts easily to needs in the field . . .

Multi-point recorder is completely flexible

As to
- **Number of monitored points**
- **Desired range**
- **Type of thermocouple**

Uses: As a versatile multiple point recording instrument which can be adapted easily —and quickly — to changing needs of plant instrumentation and control. Would be very useful in a pilot plant installation where recording requirements change frequently.

Features: Designed for an unusual amount of flexibility, this newly-engineered recorder can be changed at will by operator. Number of points to be monitored can be varied from two to 24. Range changes can be made with ease. And, in the case where the instrument is to be used for temperature recording, type of thermocouple can be changed **without** extensive rewiring or rebuilding of the recorder.

Description: Instrument is a slide-wire potentiometer recorder. It can be adapted to measure or record any input from thermocouples or

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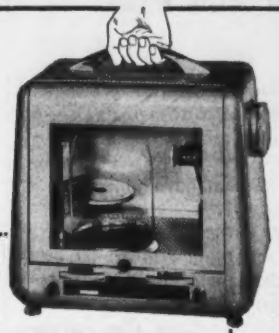

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transducers whether voltages, frequencies, temperatures, pressures, pH, or others.

Design Advantages

Key design factor in the easily-changed multi-point recorder is a 24-terminal junction board installed in each recorder whether the instrument monitors two or 24 points. This board is so engineered as to be readily removed and replaced (as are also the range clip, print wheel, and other components).

Insertion of the proper range clip and scale plate, with a

Changing the range clip on the recorder. The terminal board is at right

change of the terminal board, completes the thermocouple or transducer change procedure.

Because the cold junction compensation coil which acts as cold reference for all inputs is on the terminal board, any necessity of rewiring the unit with a thermocouple change is eliminated.

If changes are necessary in the number of points recorded, simple replacement of the number-of-stations plug, plus changing the print wheel and station indicator, is all that is required.

The number-of-stations plug is already wired to offer from two to 24 points and uses thermocouple lead wire for temperature compensation.

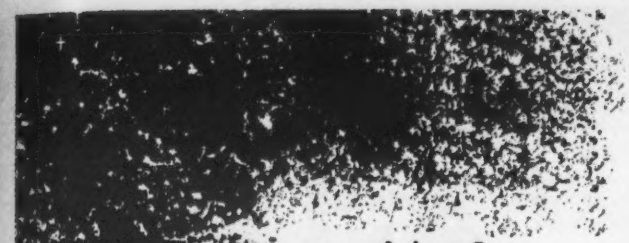
Other Features

Among other features of the instrument is a unitized method of construction, alarm switches, internal illumination,

Above, left—The GPE Controls Electric Flow Transmitter, a completely new idea in flow signal transmission. Completely transistorized, without complex mechanics, it transmits a high-level signal proportional either to flow or to differential pressure. Precise measurement and signal transmission are first in importance in good control.

Above—The Libratrol-500 Process Control System, made by Librascope and available to industry through GPE Controls, Inc., is developed around this highly reliable, rapid-response digital computer. It provides for a full range of process control—from accurate processing of data to provide understandable information to a human operator, to complete automatic control of an entire process or group of interrelated processes.

Left—One of many GPE Controls Electrohydraulic Valve Actuators that combine the speed and positive action of hydraulic valve operation with the flexibility of electrical control and signal transmission.



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Check 2338 opposite last page

a chart-tear-off, and resistance to shock, vibration, and corrosion. Accuracy is ¼%.

The instrument mounts in a standard 19-inch relay rack and can be installed with either a panel or wall mounting.

(Model 6702 multi-point recorder is product of Daystrom-Weston Industrial Div., Daystrom, Inc., Newark 12, N.J.)

Check 2339 opposite last page.

Optical level indicator has millisecond response rate

Uses: Indicating or controlling liquid level of any fluid compatible with stainless steel probe housing.

Features: Optical level indicator has millisecond response rate, distinguishes between air flow and fluid flow.

Description: Optical level indicator contains no moving parts or relays, delivers up to 10 amps to indicate or control liquid level. Incorporating a photo-electric level sensing probe, unit operates on principle of total internal reflection rather than transmission of light through fluid medium. Unit applies power to indicator lamps, pumps, valves, to indicate or control liquid level. Repeatability is within 0.015 inches.

Originally designed for use with water-alcohol mixtures, jet and hydrocarbon fuel, hydraulic and lube oils, unit can be modified for use in other fluids, regardless of opacity. Probe temperature range is −65°F to +250°F.

(Optical level indicator is product of Revere Corp. of America, Wallingford, Conn.)

Check 2340 opposite last page.

Liquid level control system which operates without floats and with no moving parts in liquid is detailed in 16-page catalog. Charts and diagrams of typical applications as well as panels for liquid level and industrial controls are shown. Liquid Level Controls Bul — B/W Controller Corp., 2200 East Maple Rd., Birmingham, Mich.

Check 2341 opposite last page.

Chromium-plated ring spins to show flow

Uses: As simple reliable safety flow indicator.

Features: Spinning chromium plated ring in flow indicator is easily visible even in bad light.

Description: Adjustable for high or low velocities of flow, flow indicator has only one moving part, the spindle. Liquid, as it passes through the indicators, spins chromium plated ring under a glass

Spinning spindle warns of flow stoppage

dome. As flow stops, ring stops spinning. Flow indicators are available in ½, ¾, and 1 inch pipe sizes for flow from 0.72 to 24 gpm. Other sizes are available for flows from .075 to 120 gpm in pipe sizes to three inches.

(Arkon flow indicators are available from Walker Crosweller Div., McIntosh Equipment Corp., 15 Park Row, New York 38, N. Y.)

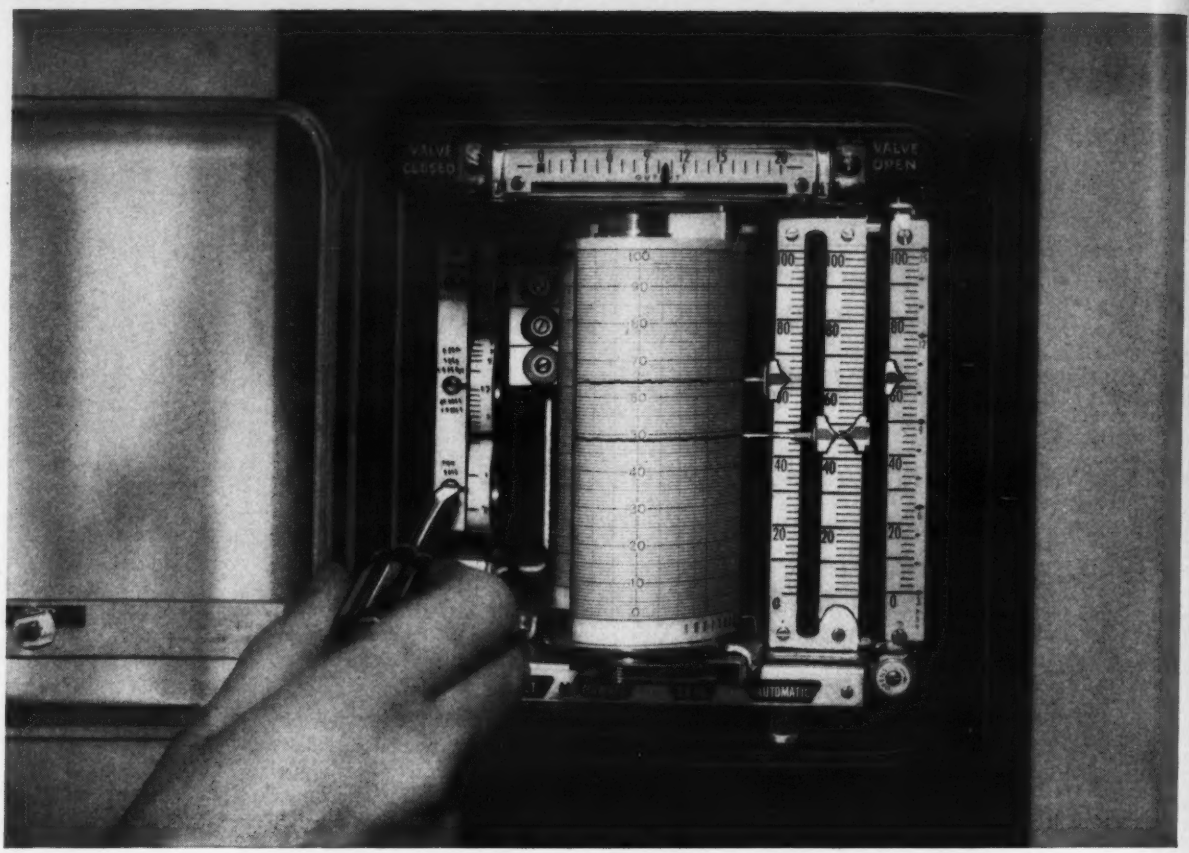
Check 2342 opposite last page.

'Package' thermocouple has insulated probe, low time constant

Insulated wire can be bent to fit needs

Uses: As thermocouple for service in liquids, gases, from −300°F to +2000°F. Can be made pressure tight to 50,000 psi.

Features: "Package" thermocouple has insulated probe,



WHY USERS ARE STANDARDIZING ON THE TAYLOR TRANSCOPE* RECORDER

Never before so many features in so little panel space!

1 All settings and adjustments made from front. Results are immediately obvious and the record is uninterrupted. Control response adjustments —when a TRANSCOPE Controller is mounted on the rear of the recorder—can be made with a screwdriver *without going behind the panel board.* Gain, reset and PRE-ACT* dials are calibrated in specific units.

This elimination of 'blind adjustments' is typical of the attention to detail that has gone into the design of the 90J series Recorders.

Also color-coded, adjustable signal-dampers (one for each recorded variable) are easy to get at, located right behind the chart drive.

2 Plug-in design. All principal assemblies are plug-in mounted for flexibility and easy accessibility. Individual unit parts are interchangeable.

3 Left-to-right record. 4" rectilinear strip chart travels from right to left for easy reading. Gives continuous 30 day record (optional 24 hr.)—3 hour visibility. Most dependable chart drive ever devised—available in electric or pneumatic form. Pneumatic impulse twice as smooth as in conventional impulse drives.

4 Bumpless Automatic-to-Manual switching. Air leakage while switching is eliminated by an ingenious "O" ring slide valve. Selector lever travel is limited by mechanical stops, insuring positive positioning.

5 More accurate records. The Servomatic ▶ Motors give precise pen positioning. Essentially a power piston with a built-in positioner, the servomatic motor is the heart of the TRANSCOPE Recorder. Delivers 150 times more power than the conventional bellows type actuation, insure lifetime accuracy and sensitivity, a minimum of maintenance. *Servos are sensitive to changes of less than 0.1% in the pneumatic signal.*

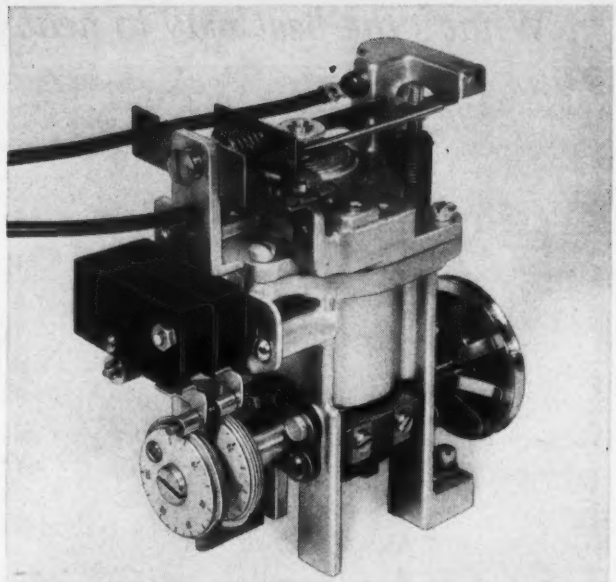
6 Process Alarms provide built-in protection. ▶ As many as six process alarms can be incorporated in one recorder housing. Attached to the servo drive shaft, they may be either electric or pneumatic. Alarms are available in various combinations and may be set for high level, low level or band.

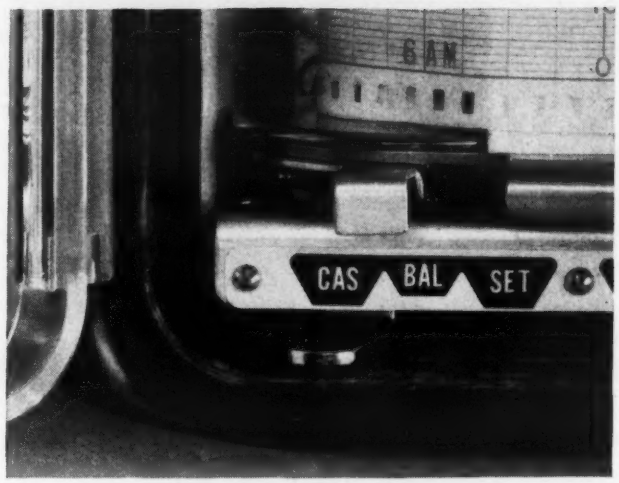
7 A Complete Cascade System in one case. ▶ The 90J Recorder was the first to incorporate a complete cascade system in one recorder case in a 6″ panel cut-out. It provides the simplest, smoothest process start-up. There are no external switches or relays. (Note unique Cascade-Balance-Set Switch.) Master and secondary variables are continuously recorded. Master and secondary controller outputs, as well as set points, are continuously indicated.

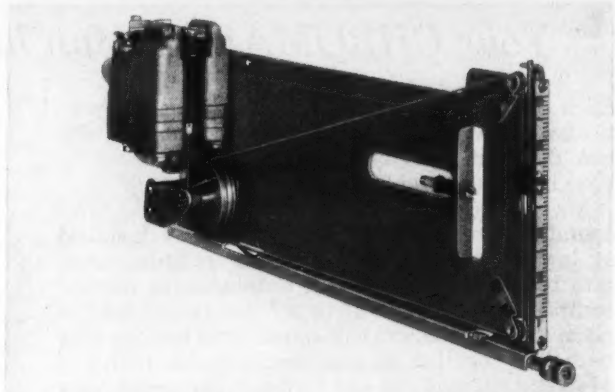
This outstanding feature of the 90J Recorder means substantial savings in instrument costs, panel space, operator's time.

8 Unique Set Point Transmitter allows continuous control. ▶ The 90J Recorder's Set Point Transmitter is a complete plug-in unit, separate from the main recording mechanism. Thus when the recorder slide is removed for checking the transmitter remains plugged into housing, keeping the process on uninterrupted, fully automatic control.

Thanks to this exclusive TRANSCOPE feature there's no need for process down time for instrument inspection or servicing.







See your Taylor Field Engineer, or write for Catalog 98286
Taylor Instrument Companies, Rochester, N.Y., or Toronto, Ontario

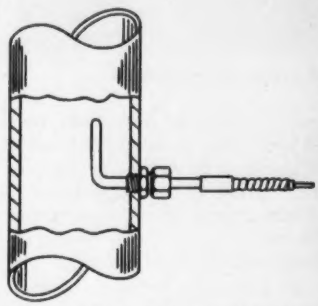
*Trade-Mark

Taylor Instruments MEAN ACCURACY FIRST

Check 2343 opposite last page

low time constant, insulated wire can be bent to fit contour.

Description: Thermocouple consists of specifically chosen wire insulated in magnesium oxide highly compressed



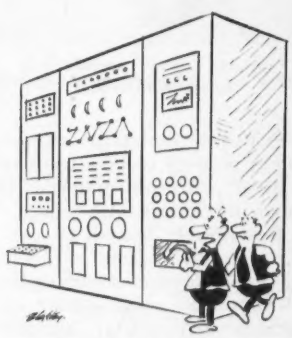
Pressure-tight thermocouple with bent wire

around it. Metallic sheath surrounds and contains the compressed magnesium oxide. Thus, the well, thermocouple wires, and insulation are put together into one package.

Different thermocouple wire can be used to suit application. Metallic sheath can be chosen to be impervious to liquids and gases of application. Time constants range from 0.014 to 0.32 seconds for exposed hot junction. Corrosion-resistant junctions are, of course, of higher time constants.

(Magnesia insulated thermocouples are product of Aero Research Instrument Company, Inc., 315 N. Aberdeen, Chicago 7, Illinois.)

Check 2344 opposite last page.



"It wants a raise."

Germfree isolators

. . . practical for small research and development laboratories, provide essentials for "living sterile test-tubes." Heavy, transparent vinyl plastic with supports of stainless steel and aluminum, units are transportable without breaking contamination barrier.

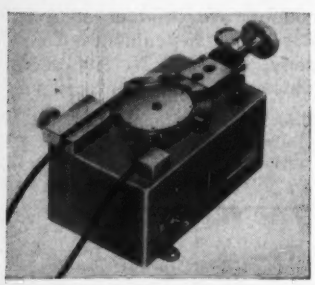
(Germfree isolators are product of American Sterilizer Company, Erie, Pa.)

Check 2345 opposite last page.

Peristaltic meter-pump permits precision transfer control

Flowing material is never in contact with pump

Uses: As continuous-duty metering pump to transfer liquids and gases through plastic or rubber tubing.

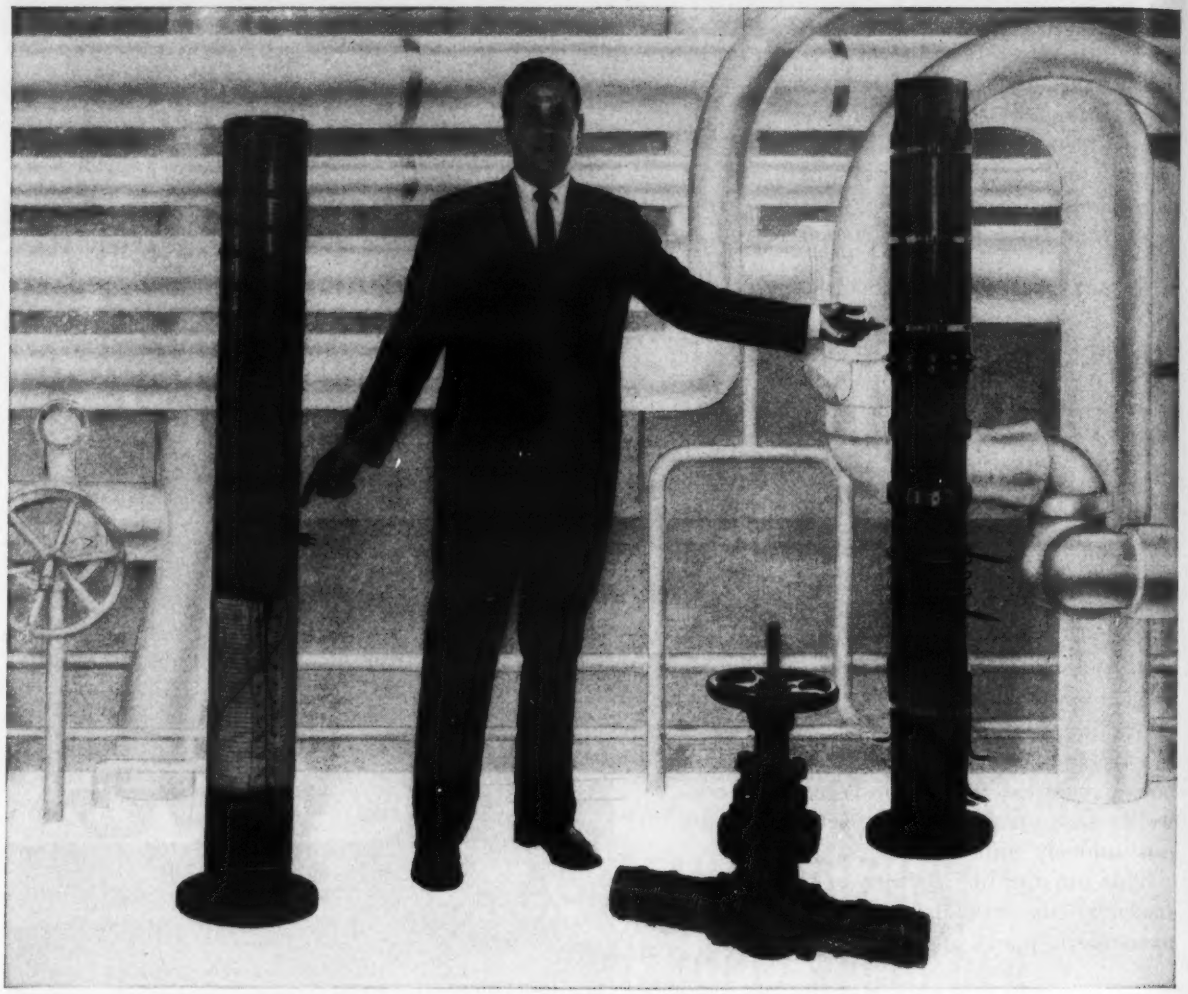


Peristaltic pump operates by compressing tubing

Features: Peristaltic meter-pump permits precise transfer control. Flowing material is never in contact with pump.

Description: Length of plastic or rubber tubing is placed in space between sliding metal yoke and small rollers on a motor-driven rotor. As rotor revolves, tubing is compressed. Gas or liquid is trapped between two rollers

What's the best way to heat a pipe?



Your CHROMALOX Man has the Answer

Each of the above pipe heating methods has particular advantages. Your Chromalox Man can help you determine the one best electrical answer to your individual problem.

Maybe Chromalox Strip Heaters best meet your operating conditions. Quickly and easily installed at low initial cost, they provide uniform, accurate temperatures by either automatic or manual control. Lengths from 4″ to 96″ can be clamped in place side by side, or, half-round strip heaters may be bolted together to a minimum inside radius of 3½″. Sheath material and terminal placement vary according to your application.

Or perhaps Chromalox Tubular Heaters are the answer. These versatile heaters are available in straight lengths or bent to any shape you may require. Only Chromalox Tubular Heaters have the patented triangular cross-section that puts more heater area into surface contact for maximum heat transfer.

Still other pipe heating problems can be solved quite simply by one of several Chromalox "wrap-around" type heaters. Chromalox Pre-Fab woven electric heaters may be held in place by lacing, adhesives or snap-fasteners. Chromalox Thermwire Tape and Cable answer hundreds of other problems that can be solved by low temperature localized heat.

What's the best way for *you*? Just call your Chromalox Representative, listed on the opposite page. He has the fast, clean, safe, accurate, economical ELECTRICAL ANSWER. He's backed by the world's largest stock of industrial electric heaters, ready for immediate shipment. And, he offers factory design engineering service for special applications.

2482

CHROMALOX
Electric Heat
INDUSTRIAL • COMMERCIAL • RESIDENTIAL
Edwin L. Wiegand Company
7517 Thomas Boulevard • Pittsburgh 8, Pa.

Check 2346 opposite last page

Call Chromalox

for the man with the ELECTRICAL ANSWERS to your heating problems

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Applebee-Church, Inc.
1389 Peachtree St., N.E.
Trinity 5-7244

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Mohawk 4-6113
Greenwood 3-4477

BALTIMORE 18, MD.
Paul V. Renoff Company
333 East 25th St.
Hopkins 7-3280

BINGHAMTON, N. Y.
R. P. Smith Co., Inc.
94 Henry St.
Phone 4-7703

BLOOMFIELD, N. J.
R. L. Faber & Assoc., Inc.
1246 Broad St.
Edison 8-6900
New York: Worth 4-2990

BOSTON 11, MASS.
Leo C. Pelkus & Co., Inc.
683 Atlantic Ave.
Liberty 2-1941

BUFFALO 2, N. Y.
Niagara Electric Sales Co.
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Summer 4000

CHARLOTTE 2, N. C.
Ranson, Wallace & Co.
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Edison 4-4244
Franklin 5-1044

CHATTANOOGA 1, TENN.
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Phone 5-3862

CHICAGO 5, ILL.
Fred I. Tourtelot Company
407 S. Dearborn St.
Harrison 7-5464

CINCINNATI 8, OHIO
The Smysor Company
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Trinity 1-0605

CLEARWATER, FLA.
J. J. Galleher
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Phone 3-7706

CLEVELAND 13, OHIO
Anderson-Bolds, Inc.
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Prospect 1-7112

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DAVENPORT, IOWA
Volco Company
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Phone: 3-2144

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Midwest Equipment Co. of Iowa
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Cherry 3-1203

DETROIT 38, MICH.
Carman Adams, Inc.
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HOUSTON 3, TEX.
L. R. Ward Company
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INDIANAPOLIS 4, IND.
Couchman-Conant, Inc.
627 Architects & Builders Building
Melrose 5-5313

KANSAS CITY 6, MO.
Fraser D. Moore Co.
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Victor 2-3306

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Richmond 7-9401

MIDDLETOWN, CONN.
Dittman and Greer, Inc.
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Diamond 6-9606

MILWAUKEE 3, WIS.
Gordon Hatch Co., Inc.
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Broadway 1-3021

MINNEAPOLIS 4, MINN.
Volco Company
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H. R. Miles and Associates
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Midwest Equipment Co. of Omaha
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Atlantic 7600

PHILADELPHIA, PA.
See "Bala-Cynwyd, Pa."

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Woessner-McKnight Co.
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115 S. Highland Ave.
Emerson 1-2900

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O. M. Thompson
Westhampton Station
P. O. Box 8762
Atlantic 8-8758

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Niagara Electric Sales Co.
133 Clinton Ave. S.
Hamilton 6-2070

ST. LOUIS 1, MO.
C. B. Fall Company
317 N. 11th St.
Suite 1001
Chestnut 1-2433

SAN FRANCISCO 3, CALIF.
Montgomery Brothers
1122 Howard St.
Underhill 1-3527

SEATTLE 4, WASH.
Montgomery Brothers
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Main 4-7297

SYRACUSE 6, N. Y.
R. P. Smith Co., Inc.
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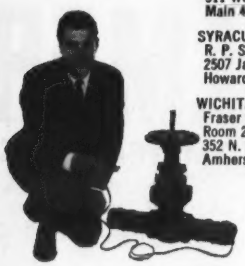
Howard 3-2748

WICHITA 2, KAN.
Fraser D. Moore Co.
Room 211 Derby Building
352 N. Broadway
Amherst 2-5647



2622

and forced through the tubing, thereby creating a suction.

Rate of flow depends on size of tubing, speed of rotor, compressibility of tubing, and roller pressure. Pumps accommodate tubing of maximum outside diameter of ¼ inch.

Tubing is readily changed. Flow rate may be as little as 2 ml per day. Other models produce as much as 75 ml per minute.

Pump weight is 8½ pounds. Power required is 110 volts 60 cycles.

(Model PA Peristaltic Pump is product of New Brunswick Scientific Company, Somerset Street, New Brunswick, N. J.)

Check 2347 opposite last page.

Flow actuated switch works pumps, valves at preset flow rate

Uses: A positive mechanical device which opens or closes electrical circuits at predetermined liquid or gas flow rates.

Features: Unit fits lines from ¼ inch to unlimited size. It may be used to start or stop pumps, alarms, signals, or actuate valves or controls.

Description: Flow actuated electrical switch is made in brass, bronze, steel, and stainless. A wide choice of switching arrangements and capacities is available. There are no glands or stuffing boxes therefore no leaks.

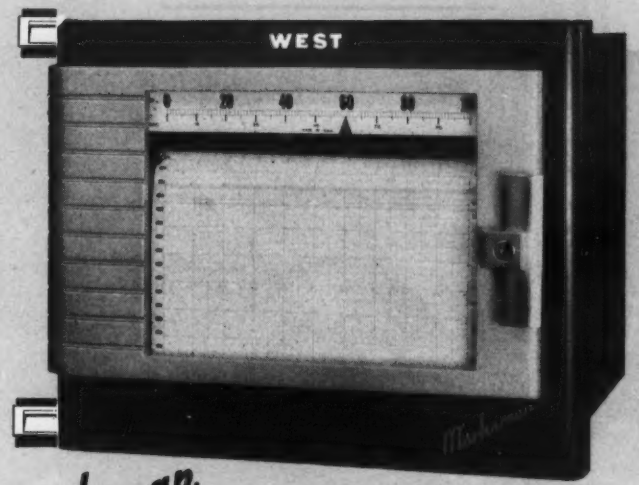
(Flow-actuated switches are a product of Power Engineering and Equipment Co., Inc., 1826 W. 213th St., Torrance, Calif.)

Check 2348 opposite last page.

Autoclaves and other equipment, including valves, fittings, reactors, built for pressures to 5000 psi, are described in eight-page Bul 658 — Autoclave Engineers, Inc., 2945 West 22nd St., Erie, Pa.

Check 2349 opposite last page.

how many?



Marksman **RECORDERS by WEST**

Now in full production, these completely new tubeless potentiometer strip chart recorders are ready to go to work for you.

Get these features in all standard models at no extra cost:

- Transistorized Amplifier
- Printed Circuits
- Dial 5 Chart Speeds
- Chart Tearoff Strip
- Automatic Standardization
- Standardizing Indicating Light
- Built-in Chart Saver
- Plug-in Construction
- Separate Chart Re-Roll Motor
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- Eleven Inch Calibrated Chart Width
- Will Mount in 19 Inch Relay Rack

Yours are ready! For data or demonstration, write for Bulletin M or phone your West representative listed in the Yellow Pages.

WEST *Instrument* **CORPORATION**
SALES OFFICES IN PRINCIPAL CITIES
FACTORY AND GENERAL OFFICES:
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REPRESENTED IN CANADA BY
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Subsidiary: West Instrument, Ltd.
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the trend is to **WEST**

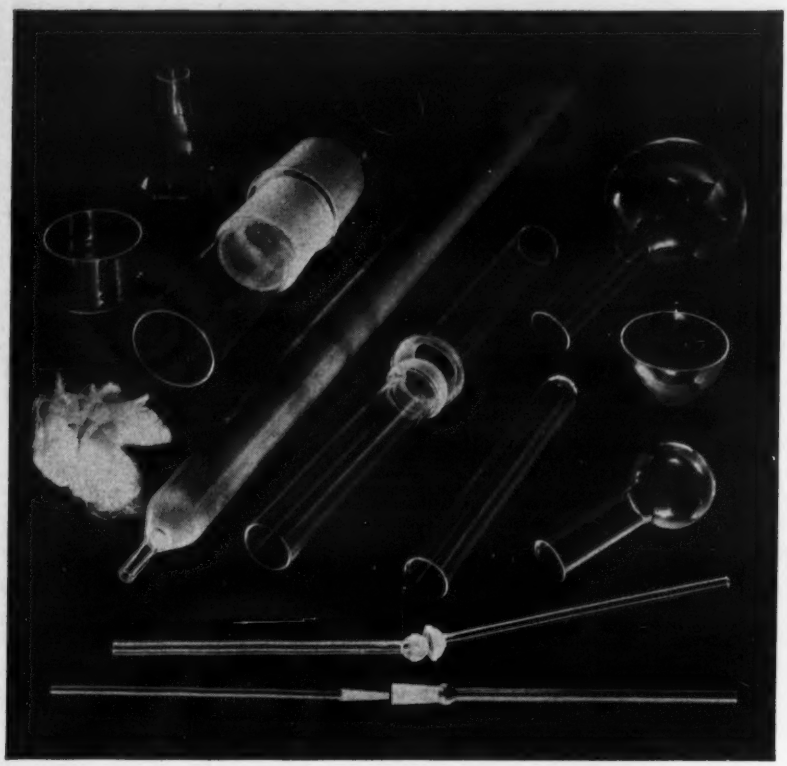
SEE US AT THE PLASTICS SHOW, NOV. 17TH-21ST, CHICAGO, ILL. BOOTH NO. 232.

Check 2350 opposite last page

GENERAL ELECTRIC FUSED QUARTZ PRODUCTS

HIGHEST STANDARDS OF PURITY

—AT NO EXTRA COST!



There are four excellent reasons why your primary source of supply for fused quartz products should be General Electric: (1) G-E High Purity Fused Quartz products are completely dependable . . . essentially free of *any* contamination. (2) General Electric offers a complete line of stock items*. (3) If it can be made from fused quartz, General Electric can do it—to *your* specifications of shape and size. (4) You get quick delivery of G-E Fused Quartz products because G.E. now has complete plant facilities devoted exclusively to this end.

CHEMICAL PROPERTIES ARE EXCELLENT

General Electric Fused Quartz is made by the fusion of very inactive natural crystals. It is chemically inert with almost all other materials—except alkaline reagents and one or two acids.

All this is but a small part of the whole exciting new story on High Purity G-E Fused Quartz. The rest is covered in an interesting publication—"G-E Fused Quartz". Write for your free copy today, to: General Electric Co., Lamp Glass Dept. CP-118, Willoughby Quartz Plant, Willoughby, Ohio.

***G-E FUSED QUARTZ STOCK ITEMS READY FOR IMMEDIATE DELIVERY**

Standard Taper Joints
Ball and Socket Joints
Graded Seals—Quartz to Pyrex
Beakers Crucibles
Flasks Test Tubes
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Progress Is Our Most Important Product

GENERAL ELECTRIC

Check 2351 opposite last page

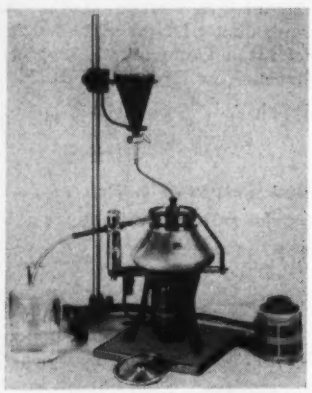
INSTRUMENTS & LAB

Automatic centrifuge harvests a few grams from large volume

Uses: Separating and collecting a few grams of material without loss of precipitate.

Features: Automatic superspeed centrifuge feeds sample continuously, harvesting precipitate in 8, 4, 2, or even 1 test tube.

Description: Revolving at speeds in excess of 16,000 rpm, centrifuge uses a reservoir containing sample. Sample is admitted to centrifugation at controllable flow rates up to 200 ml/min. After precipitate is harvested, exhausted sample is passed off into an adjacent jar.



Laboratory centrifuge separates small quantities from large volumes continuously

Device is designed into rotor cover. Centrifuges of similar design may be adapted to use of rotor cover with ease.

(Continuous-flow centrifuge is product of Ivan Sorvall, Inc., Norwalk, Conn.)

Check 2352 opposite last page.

NEXT MONTH

Simple, inexpensive weighing system that handles both liquids and solids at Tousey Varnish Company will be detailed in next month's Instrumentation section. Based on manometer gage, system is used to check raw material storage, weigh materials to blending tanks, and for formula preparation.

Outstanding Accuracy

PALMER

Dial Thermometer

Check these functional features

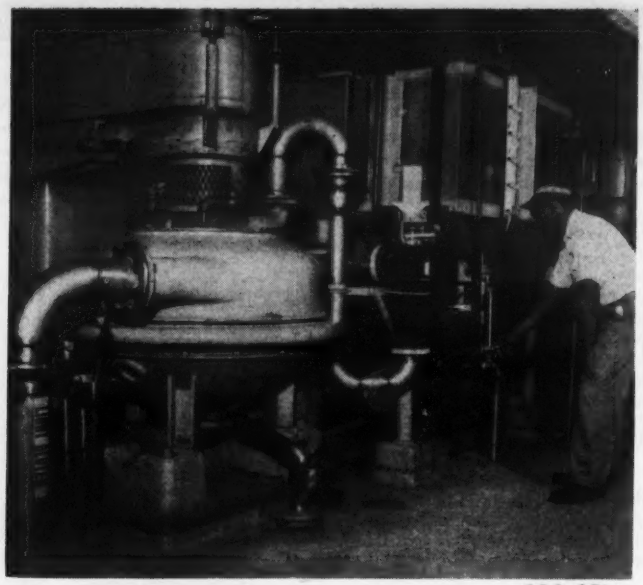
- Direct-drive Bourdon Coil with a filled system for longer lasting accuracy.
- Stem can be placed at any desired angle and case can be rotated to most readable position.
- External calibration for zero setting.
- Unaffected by stem alignment.
- Accurate to one scale division.
- No sticking at any temperature.
- Non-corrosive case.

PALMER

THERMOMETERS, INC.

Mfrs. of Industrial Laboratory, Recording and Dial Thermometers
2501 Norwood Ave., Cincinnati 12, O.

Check 2353 opposite last page

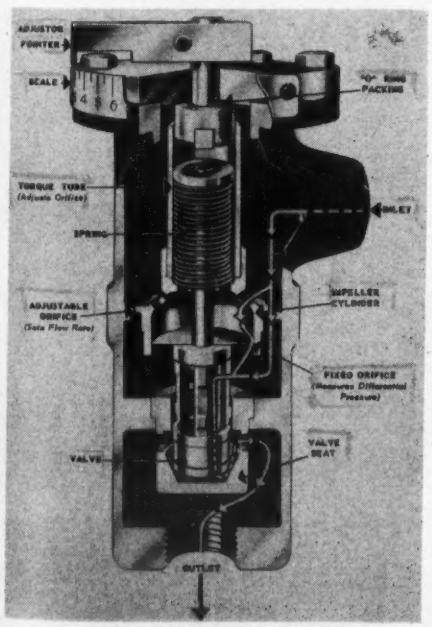


One of 13 first-pass centrifugal units used in Corn Products Refining's starch-gluten separation process. Self-contained regulator (arrow) maintains optimum slurry flow

C P Staff Photo

Engineers specifying instrumentation for Corn Products' starch-gluten separation process had a firm eye fixed on simplicity and economy. For critical first-pass centrifuges they chose a . . .

Self-contained flow regulator for accurate low-cost slurry control



Regulator provides flow control at low cost with simplicity

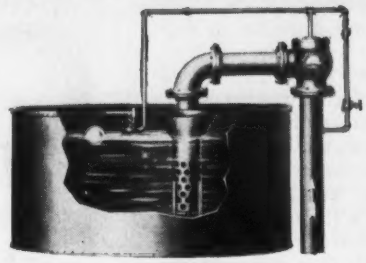
THEODORE W. WETT, Assistant Editor
with **W. S. DOUGHERTY,** Project Engineer
Central Engineering Department
Corn Products Refining Co., Argo, Illinois

Problem: Efficient initial separation of starch and gluten at Corn Products depends on maintaining constant flow rate of mill starch and wash water to first-pass separators. Estimated cost to control flow of slurry by conventional methods with accessory equipment was $1500 to $2000.

In centrifugal separation process which recently replaced table separation (See CHEMICAL PROCESSING, Oct. 1958, page 43), 13 first-pass centrifugal separators each receive mill starch slurry at a rate of 120-155 gpm. Wash water is supplied at approximately 45 gpm depending on exact slurry composition (mill starch has about 2½ lb/gal of material, 6% gluten, on a dry basis).

To obtain the optimum starch-gluten separation in this first pass, for further concentration in second-pass hydroclones,

If you have a
liquid level control problem

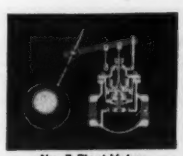


call for a valve from

Klipfel

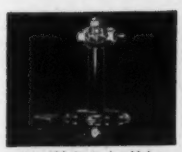
No matter what type of float valve you want, Klipfel has it. And you can get it quickly. Direct Action and Pilot Control, Single and Double Seated Float Valves are all available to give automatic level control of any liquid in large as well as small installations. Valves of special design, and/or corrosion-resistant materials built promptly.

Call your supply house, or write for Bulletin 254.


No. 7 Float Valve

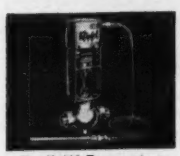

No. 27 Float Valve

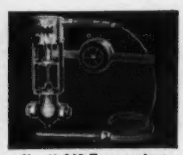
AIR MAIL
Most items shipped within 24 hours after order is received

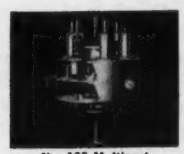

No. 410 Reducing Valve


No. 300 Reducing Valve


No. 135 Relief Valve


No. K-449 Temperature Regulator Valve


No. K-348 Temperature Regulator Valve


No. 135 Multiport Relief Valve

HAMILTON • OHIO **Klipfel** VALVES INC.

Automatic Temperature-and-Pressure-Regulating Valves Since 1902

Float Valves • Temperature Regulators • Back Pressure Valves • Reducing Valves

A DIVISION OF THE HAMILTON-THOMAS CORPORATION

Check 2354 opposite last page

it is imperative that flow of mill starch and wash water remain constant despite surges or changing pressure in supply lines.

Solution: When control system for process was finalized a self-contained flow regulator was installed to handle slurry and wash water flow. Unit requires no air lines or other auxiliaries for operation.

Regulator is an upright cylinder with flow rate adjuster-pointer located at the top. Liquid enters at side, top, and flows downward through regulator. Flow rate is determined by the amount of opening of an adjustable annular orifice.

The pressure drop across this orifice is automatically held constant by a valve, positioned by a direct force balance between this pressure drop and a spring. Any pressure change, upstream or downstream, repositions the valve so as to maintain the force balance and thus maintain constant the flow through the adjustable annular orifice.

For example, an increase in inlet pressure forces the orifice disc down, closing the valve until the force balance — and hence the flow — is restored to its original value. With an increase in back-pressure, disc rises, opening valve and restoring flow to set rate. Adjustment is immediate, restoring flow to original value.

Results: Regulators hold flow rate of slurry and wash water on first-pass separators to desired value. Operator can select flow he wants.

Units operate without accessory equipment. Cost was approximately $600 compared to $1500-2000 that would have been required with conventional control method.

(Flow rate regulators are a product of The W. A. Kates Company, 430 Waukegan Rd., Deerfield, Ill.)

Check 2355 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Three superlative Marsh products are widely used and approved by the aircraft and missile industry:

MARSH Pressure Gauges... because they combine the most advanced features ever found in pressure, vacuum and compound gauges. There is a Marsh Gauge for every conceivable application.

MARSH Needle Throttling Valves... because they are guaranteed to give micrometer regulation at HIGH pressures—pressure up to 10,000 psi—and any temperature up to 500° F.

MARSH Dial Thermometers... because they offer the precision and accuracy a precision industry demands. Most complete line; wide temperature ranges, dial sizes, patterns, finishes.

All Marsh products available with AND threads

MARSH

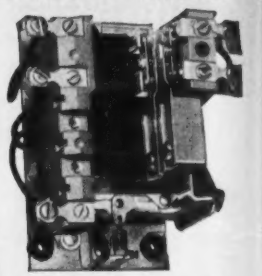
New catalog covers all details

MARSH INSTRUMENT CO. *Sales Affiliate of Jas. P. Marsh Corp.* Dept. Z. Skokie, Ill.
Marsh Instrument & Valve Co., (Canada) Ltd., 8407 103rd St., Edmonton, Alberta, Canada. Houston Branch Plant, 1121 Rothwell St., Sect. 15, Houston, Texas

Check 2356 opposite last page

LIQUID LEVEL CONTROL

● Accurate! Automatic! No floats! No moving parts in liquid. Pioneered by B/W in 1933. Controls not affected by temperatures, pressures, acids, or caustics. Remote control if desired. Ice free electrodes when necessary.



WRITE for NEW CATALOG

Describes liquid level relays, electrodes, signals, alarms and alternators. Complete descriptions, charts and diagrams. Shows panels for liquid level and industrial controls. Full of valuable information . . . Write, wire or phone.

B/W CONTROLLER CORPORATION
2204 East Maple Road, Birmingham, Michigan

Check 2357 opposite last page

DEPENDABLE

100% AUTOMATIC

REMOTE READING
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Liquidometers use a temperature compensated balanced hydraulic system. Indications unaffected by changes in specific gravity. All models feature large easy-to-read dials. UL approved switches available.

Write for complete details to Dept. D.

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THE LIQUIDOMETER CORP.
LONG ISLAND CITY 1, NEW YORK

Check 2358 opposite last page

MEASURE
actual air velocity instantly with Alnor® VELOMETER

A simple, direct reading on the Alnor Velometer gives you an instant measure of air flow speed through grilles, ducts, furnaces, spray booths, or in the open.

Precision-built and self-contained, this portable instrument brings laboratory standards to the line or field installation. Available in a wide variety of scale ranges, full assortment of jets and fittings. You'll want all the facts (no safety department should be without a Velometer). Get Bulletin 2448-G. Attach this ad to your letterhead and mail to: Illinois Testing Laboratories, Inc., Room 504, 420 No. LaSalle St., Chicago 10, Illinois.

PRECISION INSTRUMENTS FOR EVERY INDUSTRY

Alnor

Check 2359 opposite last page

Check 2360 opposite last page

Controlled heat source sustains temperatures over 22,000°F

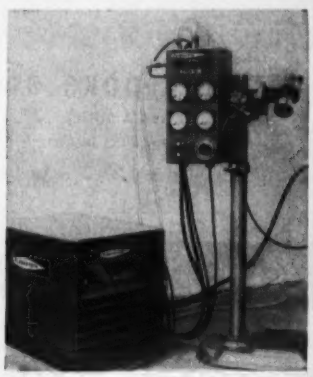
Jet will vaporize any element in periodic table

Uses: For experimental laboratory work involving extremely high temperatures.

Features: Controlled heat source sustains temperatures over 22,000°F.

Description: Called a Plasmatron, controlled heat source ejects a controlled jet of electrically neutral, partially ionized, gas at a temperature more than twice that emanating from surface of the sun.

Jet is formed from a fluid — usually a gas such as argon or air — passing through an electric arc in an enclosed chamber. Transfer of electrical energy in the arc, accelerated by thermal and magnetic "pinch" effects, results in random motion among gas ions and electrons causing intense heat and partial ionization of the gas. Resulting temperature at chamber orifice is capable of vaporizing any element in the periodic chart. Size of jet is up to ½" in diameter and 6" in length.



Heat source ejects jet at temperatures more than surface of sun

Heat source systems are manufactured in various power levels ranging from 12.5 kw to 160 kw.

(Plasmatron is product of Giannini Plasmadyne Corporation, 3839 South Main St., Santa Ana, California.)

Check 2361 opposite last page.

NEW... first truly linear *rotameter flow transmitter*

The MPT-50 Transmitter is only 5x6x12 inches but full of proven new ideas. You should see it.

Another milestone. The new Brooks MPT-50 Transmitter gives a fully linear pneumatic signal based on true flow rate, not simply float position. The MPT-50 is unique; it increases the accuracy of a transmitted flow signal. Accuracy to 1% is attainable based on air output versus actual flow rate.

Extremely low flow ranges are also within the scope of the MPT-50. You can go down to 50 to 500 cc/min. with the same dependable transmission.

Write for Spec. Sheet SS-170-1.

BROOKS ROTAMETER CO.
1158 A STREET Lansdale, Pa.
Specialists in Complete Rotameter Instrumentation

B.A.1810

Check 2362 opposite last page

King MANOMETERS
For Plant and Laboratory

King Manometers are rugged, low-cost instruments of unexcelled accuracy for measuring pressure, vacuum, differential pressure, and pressure-related phenomena. They're available in the following types, in a complete range of sizes:

U-Type Manometers
- Single Cleanout
- With 3-Valve Manifold
- Double Cleanout
- Inverted U-Type

Well-Type Manometers
- Low-Well
- Barometric-Reading
- Raised-Well
- Flowmeter Type
- Inclined-Tube

Multi-Tube Manometers
- Individual-Well
- Common-Well
- Photo-Manometers

NEW CATALOG gives details on these and other models — includes manometer liquids and accessories — explains basic principles. Write —

KING ENGINEERING CORP.
Box 270 • Ann Arbor, Mich.
REPRESENTATIVES IN PRINCIPAL CITIES

Check 2363 opposite last page

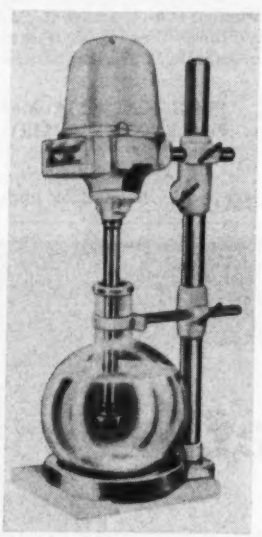
Mechanical homogenizer uses high-frequency pumping action

Ring-within-ring shears at high speed

Uses: As high-speed mechanical homogenizer-disperser.

Features: High-frequency homogenizer uses pumping action. Ring-within-ring shears sample.

Description: Milling and mixing device uses milling head, a precision combination of shearing blades. Inner ring revolves at speeds up to 18,500 rpm on a central shaft. This is encased within a stationary ring of shearing blades.



Mechanical homogenizer produces sub-micron-sized particles

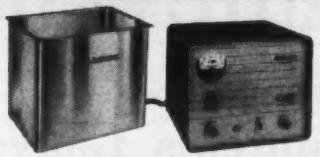
Reduction in particle size is caused by shear, impack, cavitation, and pressure changes. Combination of ring sizes, numbers of cutting edges, clearances between rings, and peripheral speed of rotor, permit diverse action.

Manufacturer claims an efficient reduction of materials to particles a few microns and sub-microns in size. Production models are also available.

(Polytron is product of Bronwill Scientific Division, Will Corporation, P. O. Box 127, Brighton Station, Rochester 10, N.Y.)

Check 2364 opposite last page.

MAMMOTH narda SONBLASTER



G-1501 generator, NT-1505 tank.

America's first mass-produced industrial-size ultrasonic cleaner!

MAMMOTH 5-GAL. TANK $695

Other models from $175. 2-year guarantee on all units.
Interior tank size (in.), 10W x 14L x 9½H. Tank Capacity, 5 gallons.

The Narda Model 1500 SonBlaster helps you save seven ways over costly solvent, alkaline or vapor degreasing! It cleans faster, speeds production, cuts rejects, eliminates bottlenecks! It saves on chemicals & solvents, cuts maintenance and downtime! What's more, there's no expensive installation; it saves on floor space and labor!

You get the tremendous activity of this new 200-watt Narda SonBlaster with the largest transducerized tank ever made, at the lowest price in the industry! Or, operate up to four submersible transducers from this same generator at one time, in any size or shape tank you desire.

Simply plug the SonBlaster into any 110-115 V AC line, and flip the switch. In seconds, you'll clean 'most any mechanical, optical, electrical, medical or horological part or assembly you can think of. Perfect, too, for brightening, polishing, radioactive decontaminating, pickling, quenching, and plating; emulsifying, mixing, sterilizing, impregnating, degassing, and other chemical process applications. Write for more information to determine the model best for you. Address: Dept. CP-7.

The SonBlaster catalog line of ultrasonic cleaning equipment ranges from 35 watts to 2.5 KW, and includes transducerized tanks as well as immersible transducers, for use in any size or shape tank.

the narda ultrasonics corporation
118-160 HERRICKS ROAD, MINEOLA, L. I., N. Y.
Subsidiary of The Narda Microwave Corporation

Check 2365 opposite last page

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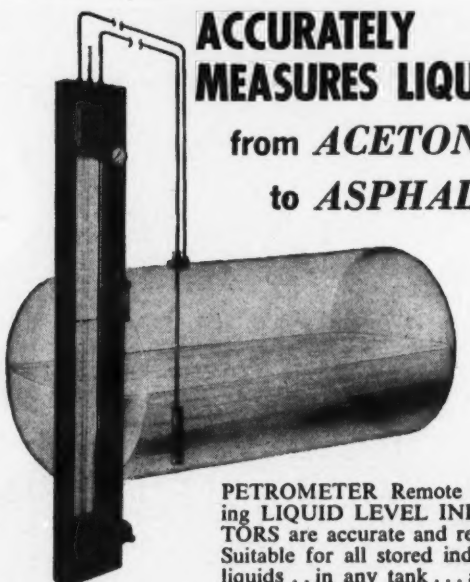

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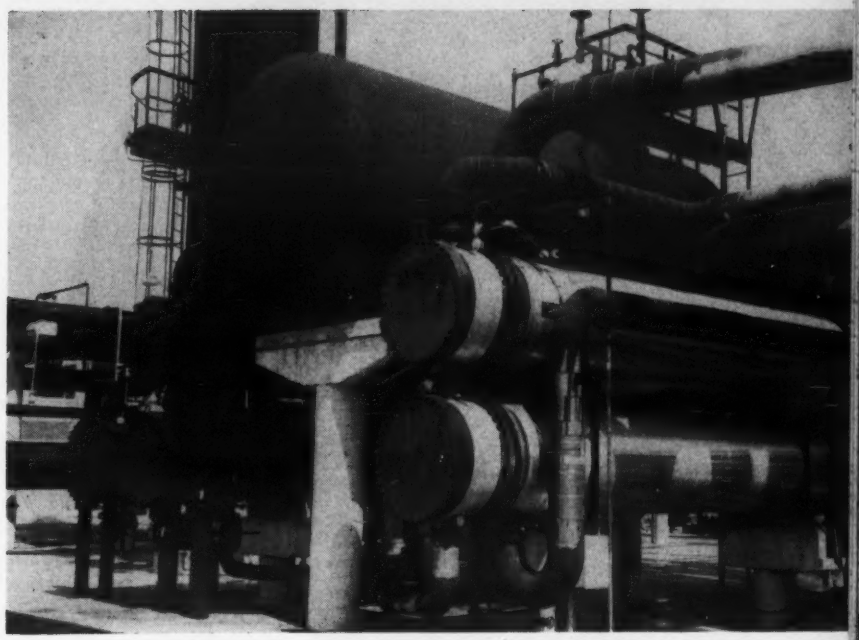


Fig. 1—Horizontal heat exchangers in butadiene recovery area

Bonded Brass Cladding PREVENTS Heat Exchanger Corrosion

Economical material used for tube sheets combines corrosion resistance of brass with high-temperature strength of steel — pull-through type of construction simplifies maintenance

GORDON WEYERMULLER, Petrochemical Editor
with **DON RIDDICK,** Section Head Design Engineering
Texas Butadiene & Chemical Corporation
Channelview, Texas

About 40 of the more than 100 heat exchangers in service at Texas Butadiene use brass-clad tube sheets which provide satisfactory corrosion resistance at minimum cost. These 40 exchangers serve as coolers or condensers in the butadiene process. Tubes in these units are admiralty. Cooling water is on outside of tubes and absorber oil on inside.

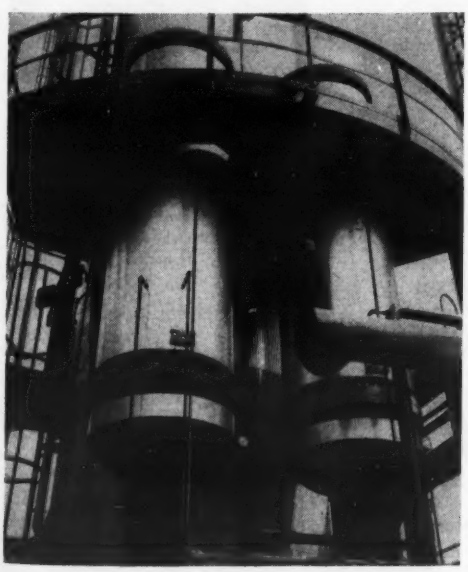


Fig. 2—Two vertical exchangers add heat to butylene splitter column

Cladding consists of ½" naval rolled brass bonded to 3 to 5" of carbon steel. Use of cladding furnishes the corrosion resistance of brass without going to brass for entire tube sheet, which would be more expensive. Also, use of carbon steel for backing gives tube sheet good strength at high temperatures. Bonding process binds the brass so firmly to the steel that when tube sheets have been drilled on occasion, bond has still been found to be intact on shavings.

All of the more than 100 exchangers use a pull-through type of construction that simplifies maintenance, permitting a bundle to be switched in a few hours. A number of the exchangers are interchangeable. Heat exchangers have given good service during the more than one year they have been in operation.

Plant is considered to have excellent thermal efficiency. Overall fuel requirements have been cut through full utilization of waste heat. This has been made possible by use of the large number of heat exchangers. Heat exchangers with a total of more than 300,000 sq ft of tube service are in use in the plant. These units contain more than 300 miles of tubes.

Accompanying photographs show some of the heat exchangers in typical services at Texas Butadiene. Units in Fig 1 are in butadiene recovery area. In this photo two exchangers on right are handling absorption oil (nearly gasoline). Lean oil on shell side is being cooled before it goes to absorber. Rich oil on tube side is being heated before it goes to stripper. Lean oil enters exchanger at 465 and leaves at 170°F. Rich oil enters at 123 and leaves at 218°F.

Of other exchangers shown in Fig 1, two of those at left (one above the other) are lean oil coolers. These are cooling the lean oil further, from 170 down to 100°F. Water at 90°F is used on tube side for cooling. These two exchangers are among those using the brass-clad tube sheets.

The other exchanger in Fig 1 (left) and another one at far left serve as intercoolers for absorber oil. The absorber oil is being cooled from 130 to 110°F with water. These two units also have brass-clad tube sheets.

Two exchangers shown in Fig 2 installed in vertical position are in recovery area on butylene splitter column (single pass thermosiphon reboiler). Steam at 70 psi is on outside of tubes and mixed butylenes on inside. These exchangers put heat into column.

(Heat exchangers were designed, engineered, and built by Texas Metal Fabricating Co., Inc., PO Box 7567, Houston 7, Texas.)

Check 2367 opposite last page.

(Plant was designed and constructed by The Fluor Corporation, 2500 S. Atlantic Boulevard, Los Angeles 22, California.)

"B&W fully annealed welded stainless steel pipe offers top corrosion resistance

I'm a plant engineer. My job is to keep the plant in operation under service conditions that are frequently rugged. And I've found that B&W Welded Stainless Steel Pipe gives me the maximum of time-in service, together with a minimum of maintenance."

Fully annealed B&W Welded Stainless Steel Pipe is produced under techniques that quality-test every inch, in rigid adherence to all your particular specifications. Because the full-annealing process provides maximum general corrosion resistance, B&W Stainless Steel Pipe offers exceptional economy where corrosive action creates problems in the handling of chemicals, pharmaceuticals, petroleum, food and dairy products.

For further information, call Mr. Tubes, your nearest B&W representative—he can help you solve any tubing problem—or write for Bulletin TB410. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

B&W TUBULAR PRODUCTS DIVISION

TA8006 PG 1

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.

Check 2368 opposite last page

Teflon-coated belt will convey hot, corrosive salts

Non-sticking, Teflon-coated, glass-fabric conveyor belt is designed for handling hot corrosive salts and other similar materials. Anti-friction properties of Teflon make it suitable for handling sticky materials with ease. Use of glass fabric for reinforcement strengthens belt.

Single ply belts in either .005 or .010" thicknesses, in widths up to 36" with a lap splice, are available.

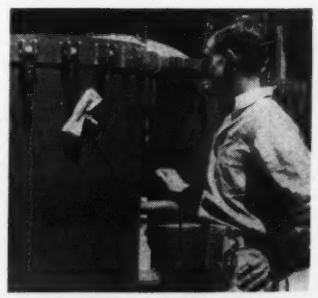
(Teflon-coated belt is a product of H. K. Porter Company, Inc., Quaker Rubber Division, 300 Park Avenue, New York 22, N.Y.)

Check 2369 opposite last page.

Inspection instrument indicates pinholes in coatings

Signals flaws in surface by ringing bell

A large protective coating company has found a low-voltage electrical inspection instrument to be of considerable advantage. Every field



Instrument can be attached to user's belt while inspection is made

engineer is equipped with one of these instruments which accurately indicates pinholes, voids, or bare spots in a surface coating.

Detector is non-destructive, the applied voltage never exceeding 68-volts. A small cellulose sponge dampened with clear water is the inspection electrode. On a thin film, the

mild current from small dry-cell batteries seeks out voids in the protective coating. It signals the presence of these voids by ringing a bell on the detector.

With this unit one man can inspect a large coated area in a short period. Flexibility of sponge makes it possible to penetrate orifices and surround edges and studs. These are areas where imperfections are most likely to occur. Excellent inspection is assured because the wet sponge provides a continuous liquid film over entire surface.

Entire unit weighs 4 pounds. It is usually attached to user's belt.

A utility in Chicago is using one of the instruments to determine when water storage tanks should be re-coated. According to engineer, the instrument has been found quite useful.

Instrument is relatively low in cost, present price being $82.50.

(Model M-1 Detector is product of Tinker & Rasor, PO Box 281, San Gabriel, Calif.)

Check 2370 opposite last page.

Zirconium and titanium tubing, along with a number of other corrosion-resistant alloys, are covered in 44-page handbook. Data is presented on applications, heat treatment, neutron transparency, corrosion resistance, and other properties.
Wall chart has also been prepared showing effects of 44 common corrosives on zirconium, titanium, tantalum, Hastelloy C, and 316 stainless. Tubing handbook & wall chart—Damascus Tube Co., Greenville, Pa.

Check 2371 opposite last page

NEXT MONTH

A Canadian sulfur company's successful use of access fittings — which provide safe entry to a line against pressure — will be covered in a case history story. Fittings permit corrosion coupons to be inserted and removed under pressure. Hydrogen probes and a corrosion-testing meter have also been used with the fittings at the plant.

FOR TOUGH SEALING JOBS
where service conditions indicate Flexitallic Gaskets

In the field of high-pressure seals, engineers know and look for Flexitallic Blue, the blue-dyed Canadian asbestos filler that identifies the original Flexitallic Spiral-Wound Gasket construction.

- For operations where an effective seal is required to help protect an entire line or process
- For unusual joint stresses such as vibration, weaving, thermal and mechanical shock

In Flexitallic Gaskets, where the compression characteristics for a given pressure series are *always* related to the bolting load for that series, engineers get remarkable flexibility demanded in the application. Once the design is right for a given service, Flexitallic Gaskets are made under exacting mechanical controls to assure that manufactured gaskets conform to specification.

For the right combination of metal "spring" and non-metal filler, look for Flexitallic Blue . . . insist on Flexitallic Gaskets, exclusively spiral-wound construction since 1912.

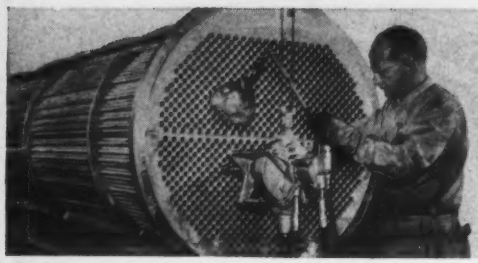
FLEXITALLIC GASKET CO.
8th & Bailey Sts. Camden 2, N.J.

Flexitallic®
SPIRAL-WOUND GASKETS

R PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

*Flexitallic is a registered tradename. No one else can make a Flexitallic Gasket. Look for *Flexitallic Blue* — it's our exclusive blue-dyed Canadian asbestos filler.

Check 2372 opposite last page



CONDENSER AND HEAT EXCHANGER CLINIC

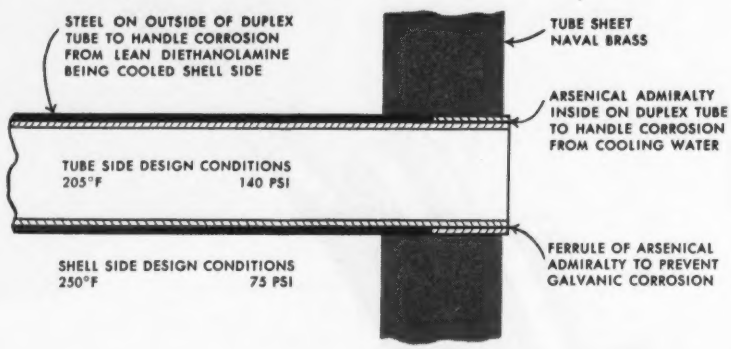
Edited by David S. Hibbard, Metallurgical Engineer
The American Brass Company, Buffalo 5, N. Y.

Duplex tube applications increase as corrosion and temperature-pressure problems grow more complex

New and improved processes in the chemical and petroleum industries—advancing design in power equipment both ashore and afloat, involving ever higher temperatures and pressures—are calling for more and more duplex tubes.

Working closely with both users and manufacturers of heat-exchange equipment, The American Brass Company is expanding its facilities to provide these special-purpose tubes in the combinations of metals and in the sizes and gages to meet new and growing needs.

Dual corrosion problems. Anaconda Duplex Tubes have been most often used to meet situations involving dual problems of corrosion. They are made by drawing tubes of copper or a copper alloy either inside or outside of steel tubes. However, they can be furnished in any combination of metals, including copper or copper alloys with other nonferrous metals or steel in a wide range of diameters and wall thicknesses.



SKETCH SHOWING CONSTRUCTION of Anaconda Duplex Tubes used in the cooler designed and built by Yuba. Tubes are ¾" O.D. x .065" wall x 16'1⅛" long. The 1/16" thick tube sheets of Anaconda Naval Brass are 31⅝" in diameter and 35⅞" in diameter.

For extra strength. More and more Anaconda Duplex Tubes are being used in those applications where internal or external pressures—or the pressure temperature combinations—are too great for a nonferrous tube alone. In this case the nonferrous tube is selected for the chemical properties required for the more corrosive fluid handled; and the steel tube gives the needed strength.

U-bends. Duplex tubes can be readily bent to form the hairpin or U-bend tubes required for the compact U-bend tube design so advantageous in heat exchangers where wide temperature differences exist in the unit.

Technical Assistance. Specialists at the American Brass Company are constantly working with manufacturers and users of heat-exchange equipment, helping to solve process problems. This experience is available to you. For more detailed information on Duplex Tubes, U-bend Tubes, address: The American Brass Company, Buffalo Division, Buffalo 5, New York. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

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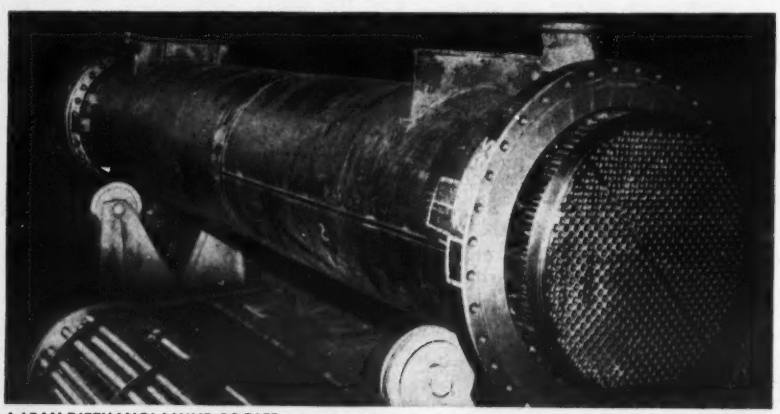


A LEAN DIETHANOLAMINE COOLER using Anaconda Duplex Tubes (see detail sketch above) designed and built by Yuba Heat Transfer Division of Yuba Consolidated Industries, Inc., Honesdale, Pa. This unit will cool Lean Diethanolamine at the new 19,000 barrels per stream day delayed coker designed, engineered and being constructed for Socony Mobil at Paulsboro, N. J. by The Lummus Company.

ANACONDA®
TUBES and PLATES for CONDENSERS & HEAT EXCHANGERS
Made by THE AMERICAN BRASS COMPANY

Check 2373 opposite last page

CORROSION CONTROL

Reinforced epoxy pipe builds service record handling corrosives

Principal reason for the growing acceptance of reinforced epoxy pipe for a variety of corrosive applications is the outstanding service record it has built up. Epoxy pipe, reinforced with braided glass sleeving, has already lasted two years or longer on some very tough applications.

Reinforced plastic pipe has been found to resist about 340 different corrosives at temperatures up to 300°F. Pressures as high as 1000 psi have been withstood.

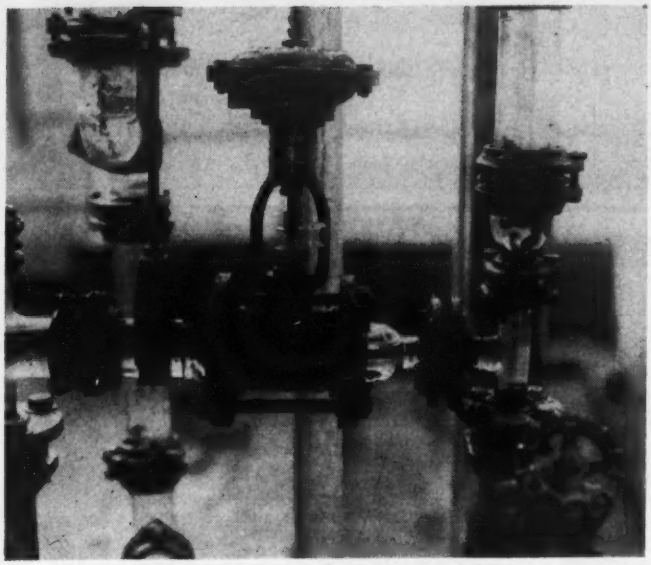
In one typical application, epoxy pipe has lasted 26 months so far handling 18% HCl at 180°F and 300 psi. In another installation, the pipe has withstood 50% H_2SO_4 at 140°F and 75 psi for 18 months to date. Among other acids successfully handled are 5% nitric, adipic, phosphoric, hydrofluoric, and fatty acids.

Sodium hydroxide of 50% strength has been resisted for six months at 230°F and 40 psi. Brine and chlorine have been successfully handled — along with salts, solvents, and other industrial fluids. For example, benzene has been withstood for 30 months at 100°F and 325 psi. Ferric chloride hasn't been too tough for the epoxy pipe during 11 months service at 185°F and 250 psi.

Economic data show that the epoxy pipe is the lowest cost piping available for a large number of both mildly corrosive and highly corrosive applications.

(Condensed from technical paper, "An Application, File on Reinforced Epoxy Pipe," which was presented at the National Association of Corrosion Engineers Annual Meeting in San Francisco in 1958. Paper was prepared by H. D. Boggs, General Manager, and E. D. Edmisten, Quality Control Manager, Fibercast Company, div. of The Youngstown Sheet and Tube Company, PO Box 727, Sand Springs, Okla.)

Check 2374 opposite last page.

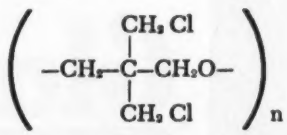


Control valve is sandwiched between two flanges in the plant

Penton control valve withstands 32% HCl

While alloy parts failed in three days in the severe service, chlorinated polyester polymer has shown no sign of corrosion since installation July 29th

GORDON WEYERMULLER
Petrochemical Editor
with **DEANE MILLIKEN**
Instrument Engineer
Hercules Powder Company,
Parlin, N.J.



Penton is a chlorinated polyether of high molecular weight

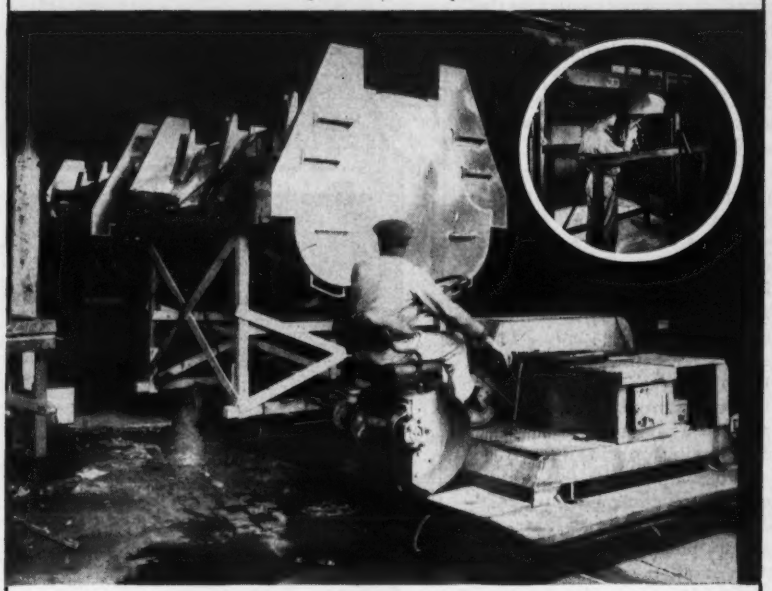
Problem: Alloy stem, plug, and seat used in control valve at Hercules Powder Co., Parlin, N. J., almost completely disappeared after three days use, causing valve to fail.

The ½" valve was installed in the Chlorinated Products Area in a Pyrex brand glass line, sandwiched between two flanges. It was used to regulate flow of 32% hydrochloric acid containing some chlorine and carbon tetrachloride. Valve was in the line after a Karbate cooler which brings liquid temperature down to 60-80°F. Line pressure is about 5 psi.

Valve can be used for steady-flow or on-off control at 3-15 psi; air-to-open or air-to-close. Design employs diaphragm operator, threaded bonnet, removable seat, and any desired flow-characterized plug.

Solution: Wetted parts of

LITHCOTE PROTECTS
LITHCOTE PROTECTS

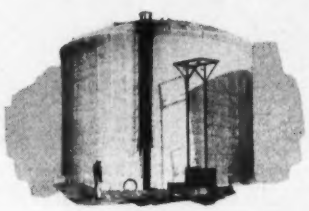


HERE'S HOW LITHCOTE PUTS PERMANENT PROTECTION ON DIFFICULT SHAPES AND SIZES...

This is one of several special aluminum trailer tanks—being dollied into a Lithcote oven for a spray coating of NEOPRENE. It's the kind of job that requires the best in application facilities and experience.

NEOPRENE, of course, is only one of the materials Lithcote applies to all shapes and sizes of metals. AMERCOAT, BISONITE, COLUMBIA #7, COPON, PLASITE, UNICHROME, KEL-F, as well as the famous LITHCOTE line of products are also available.

Point is, Lithcote is best qualified to handle any or all of your corrosion and contamination problems, and can do it faster with resultant savings to you!



FIELD APPLICATION
Lithcote Crews are regularly on the job to help *cut the high cost of field applications.* Work can usually be completed without interfering with regular plant routine.

ASK FOR CATALOG
For more than a "product" bulletin. Lists actual applications in industry of all kinds. Gives complete data on famous Lithcote line.

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36 W. 44th St., New York 36, N. Y.

Check 2375 opposite last page

NOV 58

valve — stem, plug, and seat — were replaced with Penton, a recently developed chlorinated polyether polymer of high molecular weight. (Body of original valve was made of the same plastic.) Teflon packing is used. After valve was rebuilt, it was reinstalled on line on July 29th.

Penton is a thermoplastic polymer with outstanding resistance to corrosion. It is resistant to all inorganic acids except fuming nitric and fuming sulfuric — and is not affected by many solvents and salts or 15% caustic. These corrosives can be withstood at temperatures to 220°F or higher. Temperatures as high as 300°F have been resisted in certain applications.

Workability of the chlorinated polyether permits ready fabrication of valves and pump parts. It can be injection molded or extruded.

Results: Control valve using Penton wetted parts is still operating under the severe conditions and shows no sign of corrosion.

(Penton thermoplastic polymer is product of Hercules Powder Co., Wilmington 99, Delaware.)

Check 2376 opposite last page.

(All-Penton control valve is available from Uniflow Valve Corp., 19 Quine St., Cranford, New Jersey.)

Check 2377 opposite last page.

(Solid Penton extruded stock used for valve is product of The Polymer Corporation, Reading, Pa.)

Check 2378 opposite last page.

Evaporators resist effects of acid corrosion for two years

Maintenance requirements have been practically nil on five single-effect vacuum evaporators being used to handle a highly acidic liquor at the American Enka Corporation rayon plant in Enka, North Carolina. Each of the units, which consists of a heater and separator, is capable of evaporating 14,000 lb of water an hour from rayon

HEAVY-DUTY DRIVE ASSEMBLY — Smooth, efficient, quiet running. Two drive reductions transmit ample power for all agitator needs and speeds. Tapered and radial roller bearings assure friction-free, straddle-mounting for pinion shaft. Heavy-duty gears, bearings and shafting — also available with gear head and variable speed motors. Protected by full-bath lubrication.

EXCLUSIVE ROTARY MECHANICAL SEAL — Superior for high-pressure or vacuum processing. (1) Eliminates leakage under pressure (toxic or explosive conditions) and reduces maintenance. (2) Permits efficient use of higher operating pressures... prevents metallic and catalytic contamination of vessel contents. Outstanding features: pre-loaded, double-tapered roller bearing, glass-coated gland insert, glass-coated agitator shaft and Teflon packing.

EXTRA-DEEP STUFFING BOX (not shown) is supplied as standard equipment. Exclusive design of 2-piece lantern ring minimizes maintenance. Glass-coated or alloy-packing plate fits tightly around agitator shaft. Latest packing materials and shrink-fit alloy sleeve for severe conditions are available.

NEW SWING CLAMPS ASSURE EVEN PRESSURE on both flanges — can't twist sideways . . . minimize danger of cracking glass. Clamp positions permanently on flange — can't be lost. Saves considerable time on process changeover.

CHOICE OF THREE BAFFLES—with restricted tips for handling great number of viscosities, specific gravities and particle sizes. (A) Spade-type baffle (B) Glass-lined tip which is an integral part of the baffle itself. (C) Removable alloy plug receives alloy tip whenever need arises.

Glascote®

PRODUCTS, INC.

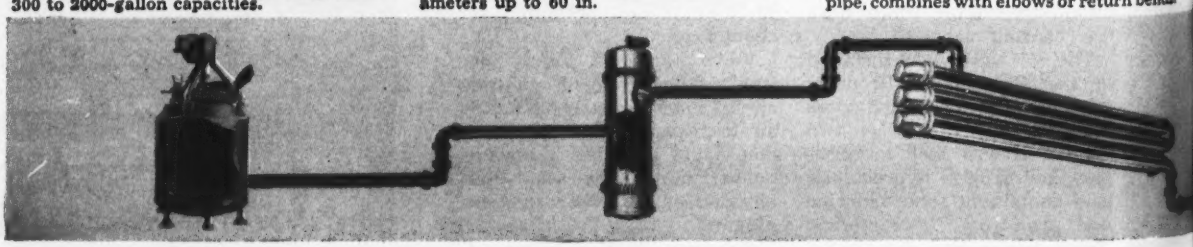
CLEVELAND 17, OHIO

Sales offices or agents in principal cities. Export Sales:
A. O. Smith INTERNATIONAL S. A., Milwaukee 1, Wisconsin, U. S. A.

GLASS-LINED REACTORS — Three types: HR, CR and SR. Custom-built up to 8,000 gallons. Standard units from stock range from 300 to 2000-gallon capacities.

GLASS-LINED COLUMNS — Standard and special packed units in glass-on steel or alloy metals. Built to your specifications in diameters up to 60 in.

GLASS-LINED HEAT EXCHANGER TUBES. Easily assembled into corrosion-resistant heat exchangers. Standard-diameter jacketed pipe, combines with elbows or return bends.



CORROSIVE PROCESSING

Glascote® glass-lined products

Stop corrosive attacks . . . help you increase yield thru zero contamination

Make Glascote chemical-resistant, acid-alkali glass *your first line of offense against corrosion and contamination.* An inventory of more than 3,000 glass formulas developed by Glascote and its parent organization, A. O. Smith Corporation, gives you the best in corrosion resistance and eliminates danger of metallic contamination.

Glascote offers you reactors, columns, storage tanks, rotary dryer-blenders, pipe and fittings — *all glass-lined* for processing a variety of corrosive materials with start-to-finish application versatility.

Glascote also offers you non-stick glass which is ideal for polymer production of all types.

Glascote clamp-top reactor, left, is typical of many products supplied for laboratory, pilot plant and full-scale commercial production, engineered and fabricated by Glascote to your exacting specifications.

Looks hard to manufacture, but Glascote skill makes it easy!

Superior knowledge of combining glass and steel qualifies Glascote to find quick, easy solutions to many process problems. This top head is typical. All told, there are nineteen 4-inch inlets. The manhole measures 24 inches in diameter.

Custom and standard reactors

Glascote reactors include designs in the HR (heavy-duty closed), CR (clamp-top) and SR (standard closed) series. Custom-built reactors available in capacities up to 8000 gallons dependent on design pressures. Standard units available from stock in a range from 300 to 2000 gallon capacities. ASME constructed.

Ask the representative who calls on you for all the facts about Glascote products — reactors, storage tanks, columns, conical rotary dryer-blenders, receivers, condensers and accessory products. Or, if you prefer, write direct. Glascote Products, Inc., Cleveland 17, a subsidiary of A. O. Smith Corporation.

Our standard one-year guarantee continues to apply to all Glascote glass-lined products.

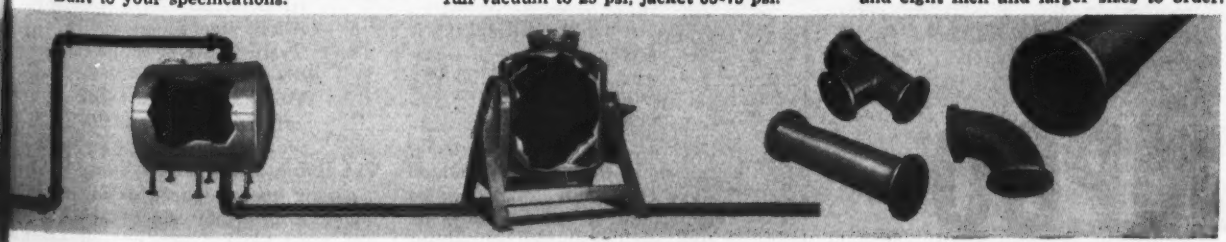
A subsidiary of **A.O.Smith** Corporation

World's largest manufacturer of glass-lined steel products

GLASS-LINED STORAGE TANKS — Single shell horizontal types and vertical units available. Plain, jacketed, open and closed. Built to your specifications.

GLASS-LINED CONICAL, ROTARY DRYER-BLENDERS — Capacities 5, 35 and 110 cu. ft. as standard and larger on request. Pressures: tank full vacuum to 25 psi, jacket 65-75 psi.

GLASS-LINED PIPE AND FITTINGS—Available in 10-ft. lengths, fittings to ASME standards, in inside diameters from 1½ to 4 in. Six and eight inch and larger sizes to order.



Check 2379 opposite last page

spinning bath solution.

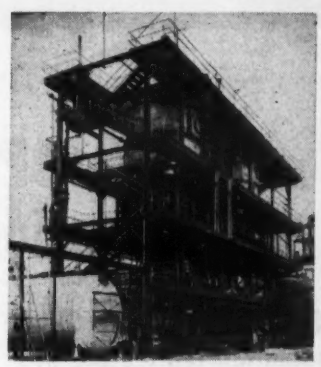
Variety of corrosion-resistant materials are used in construction of units. Heater section has rubber-lined liquor and vapor chests and Karbate graphite tubes. Tubes are cemented to flexible gaskets in tube sheets. Tube sheets in 4 of units are lead and in the other one they are Haveg. Vapor separator shell is rubber lined.

(Evaporators are product of Buflovak Equipment Div., Blaw-Knox Co., Buffalo, New York.)

Check 2380 opposite last page.

Vinyl coatings protect Texas City plant

Corrosive chemical fumes and salt air are being successfully withstood by vinyl coatings on the Texas City, Texas plant of Union Carbide Chemicals Company. Previous coatings used in this same service failed in about 6 months or



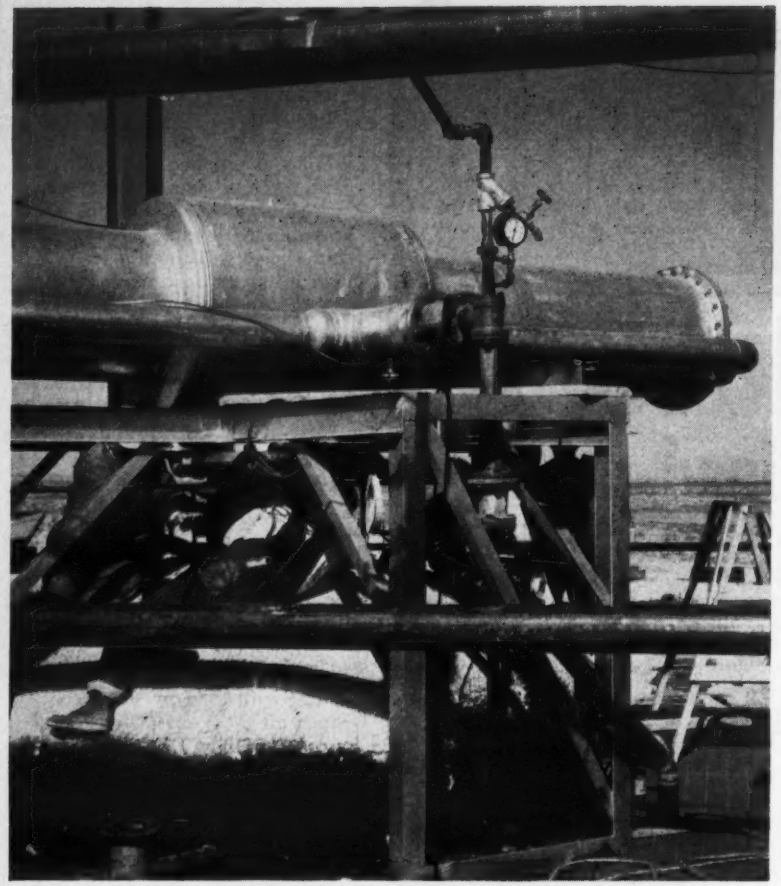
Vinyl coatings on acid storage equipment are still in good condition after 3 years service

less. Present vinyl coatings have already given over 3 years service in some areas and are still in excellent condition.

Hot-spray vinyl base coating system used consists of 3 coats for a total film thickness of 12 to 15 mils.

(Vinyl resins used in coatings are product of Bakelite Co., Div. of Union Carbide Corp., 655 Madison Ave., New York 21, New York.)

Check 2381 opposite last page.



After nine months' service, the potash crystallizer being field-assembled above showed no sign of stress-corrosion cracking — even though it was not stress-relieved or heat-treated.

STOPS stress corrosion cracking!

NEW AMPCO METAL GRADE 8
simplifies fabricating of copper-base alloy equipment

Improved Ampco Metal Grade 8 puts an entirely new slant on fabricating copper-base alloy equipment to handle steam and corrosive media at elevated temperatures.

At one petro-chemical plant, for example, piping of Ampco Metal Grade 8 was field-assembled without heat treatment. It has handled hot sulphuric acid for more than a year without stress-corrosion cracking.

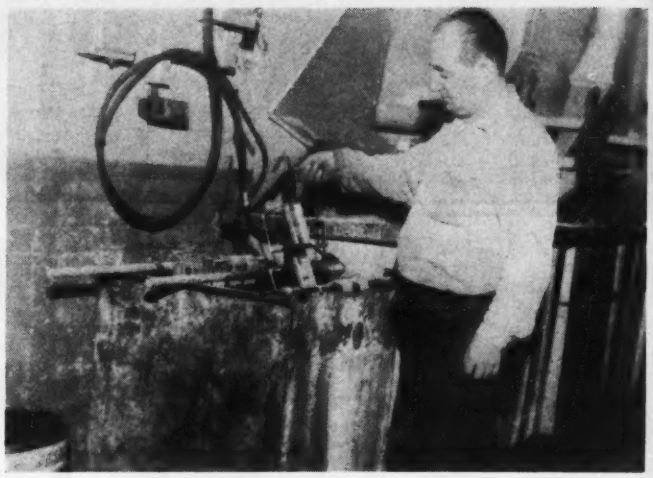
New, patented Ampco Metal Grade 8 also simplifies field repairs and alterations. You can weld readily with any electric process, without pre-heat or post-heat and without hot-short cracking.

Talk this over with your Ampco field engineer. Or write for details. *Ampco Metal, Inc., Dept. 131-K, Milwaukee 46, Wis. West Coast plant: Burbank, Calif.—Southwest plant: Garland (Dallas County), Texas.*

TS-4

AMPCO®

Check 2382 opposite last page



CP Staff Photo

Tank holds solution containing mixture of H_2SO_4, HNO_3, and HF. Lining has withstood strongest corrosives

Strong acids, alkalis, and rough handling have failed to damage Polyfluoron tank linings as it . . .

Takes toughest corrosives for over 2½ years

THEODORE W. WETT, Associate Editor
with **CHRISTOPHER MARZANO,** Chief Chemist
Amphenol Electronics Corp., Chicago, Ill.

Every corrosive material that could be found, from a sulfuric, nitric, hydrofluoric acid mixture to a bright dip solution for copper and copper alloys, has been handled by Polyfluoron-coated tank. Tank has been in service for two and one-half years.

Test tank, 2′ x 2′ x 2′, was obtained by Amphenol as part of a search to find a suitable tank for multiple application use.

To test tank's suitability, it was used in a variety of services, wherever additional capacity was momentarily required. This resulted in considerable handling and truck transportation which added wear to already tough service conditions. In the course of its two year gauntlet of corrosives, tank has been used in various production lines to hold:

1 — Concentrated HCl
2 — 10-20% HCl
3 — 10-30% H_2SO_4
4 — Mixture of H_2SO_4 and HF
5 — Mixture of H_2SO_4, HNO_3, and HF
6 — Chromic acid bright dip
7 — Copper bright dip solution at 150°F (H_2SO_4, HNO_3, trace HCl)
8 — Alkali steel cleaner
9 — Cyanide strip solution for gold (8 oz cyanide, 4-6 oz caustic/gal). Six volts are used for stripping.

The lining is still intact.

Lining was prepared as follows: Interior of steel tank was sand blasted. An organic prime coat was applied fol-

lowed by several coats of Polyfluoron (a high polymer of trifluorochloroethylene) dispersion system. Each coat of dispersion was fused at 475°F. Total thickness was seven to eight mils.

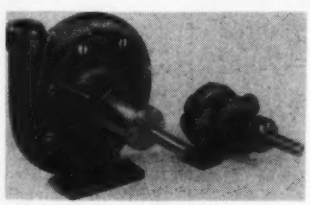
(Polyfluoron coating was applied by Acme Resin Corporation, 1401 South Circle Ave., Forest Park, Ill.)

Check 2383 opposite last page.

Stainless steel pumps prevent corrosion, contamination

Small multi-purpose centrifugal and impeller-type stainless steel pumps are designed for use wherever corrosion or contamination prevention is required.

Shafts, body, and cover of centrifugal unit are made of type 20 stainless. Stationary seats are of the same material and, in addition, are ceramic faced. For pumping of caustics, Stellite seats can be supplied. These units are particularly suited for corrosive conditions.



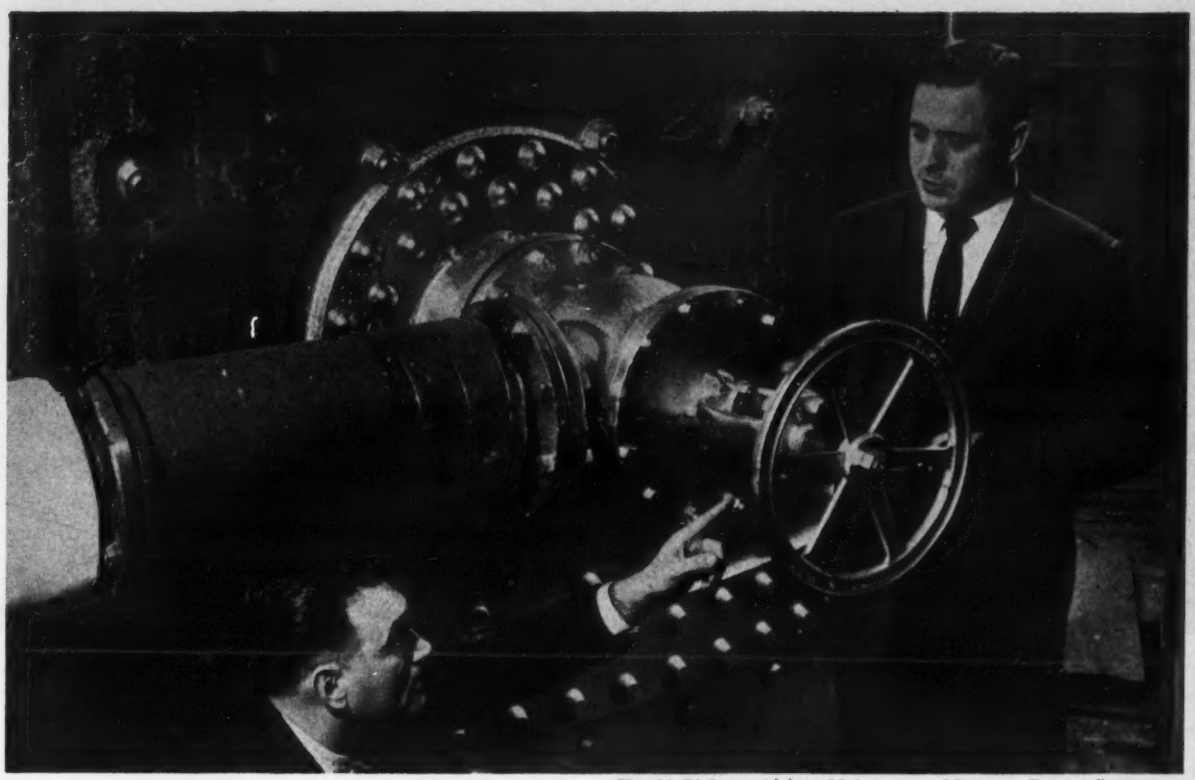
Stainless steel pumps are designed to withstand severe operating conditions and maintain product purity

All mechanical seals are corrosion resistant and rotary faces of either carbon or glass-filled Teflon construction are available.

Impeller-type stainless steel pump is particularly designed to prevent contamination of the materials handled. This unit is self-priming and will pass small solids. It is made entirely of 316 stainless. Two sizes for 10 and 25 gpm respectively are available.

(Stainless steel pumps are product of American Machine Products, Inc., 172 Centre Street, New York 13, N.Y.)

Check 2384 opposite last page.



Harold Blakney (right), Maintenance Manager, Brown Company, Berlin, N. H. Left, Frank Hiltz, Vice President Brown Wales Co., Cooper Alloy distributors, Auburn, Me. Center, Cooper Alloy 8" angle circulating valve on digest tank.

BLAKNEY of BROWN COMPANY

tells why Cooper Alloy Valves suit him

Q. Mr. Blakney, why does Brown Co., a leading manufacturer of pulp, paper, and other forest products, use stainless valves and fittings in its mills?

A. Because stainless steel is one of the few materials that can take the tough corrosion punishment of pulp mill digester fluids.

Q. Why Cooper Alloy valves?

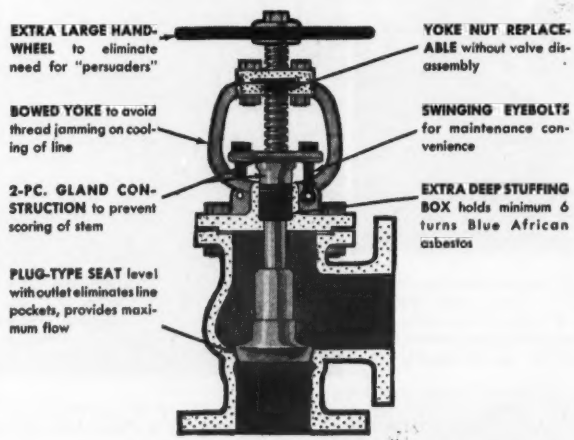
A. For long life and low maintenance. Over the years Cooper Alloy valves have proven themselves to be extremely well designed for the tough service we give them.

Q. How, specifically?

A. Well, these 8" angle valves, for example, have that extra-deep stuffing box to give a tighter stem seal. The seat, level with the outlet, eliminates line pockets and provides maximum flow. These plus extra large handwheel all give me less maintenance problems.

Q. Anything else you like about Cooper Alloy valves?

A. Yes, I like the engineering service available from Cooper Alloy we have had occasion to use, and the fine fast delivery and service we obtain from Brown Wales' nearby warehouse.



A VALVE DESIGNED FOR STAINLESS! The Cooper Alloy valve is not an adaptation of earlier brass and iron patterns. Cooper Alloy, with over 35 years of experience in handling stainless steel, created a valve *designed to be cast in stainless!* Check the Special Design Features shown at left.

As the little CA man below is saying: *"You can tell a Cooper Alloy Valve as far as you can see it!"* Write today for *your* copy of our folder "Valves and Fittings in the Pulp and Paper Industry." The Cooper Alloy distributor near you will be glad to show you the complete line of Cooper Alloy valves *and fittings*, and their advantages. He can serve you promptly from local stocks.

COOPER ALLOY

Corporation • Hillside, New Jersey

FOUNDRY PRODUCTS DIVISION

THIRTY-FIVE YEARS OF STAINLESS STEEL PIONEERING

Check 2385 opposite last page

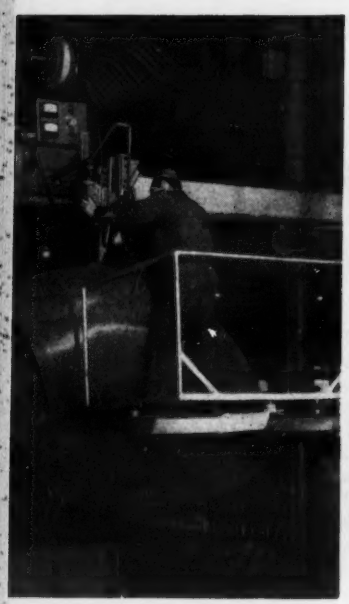
"SPECIAL" Welding Fittings

by MIDWEST

Special gauges and instruments are used to make sure that we have complied with the extremely close tolerances often required on stainless fittings. Here wall thickness and concentricity were held within extremely close limits throughout the fittings.

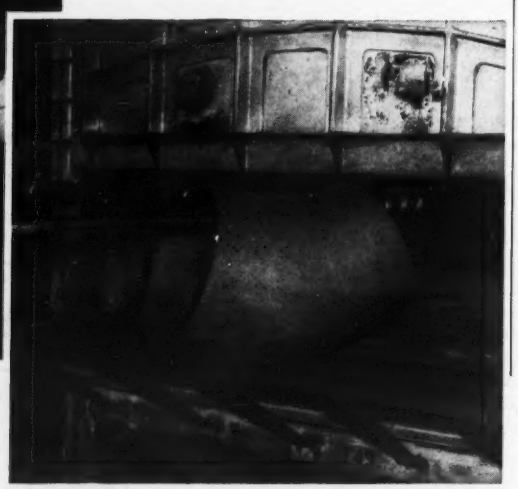
The exclusive Midwest method of manufacture—much more versatile and flexible than any other—enables us to make almost any type of special welding fittings to the most rigid specifications. Midwest makes welding fittings from *plate* . . . usually much easier to get than pipe, particularly if the material is special. That expedites delivery. Closer tolerances are inherent in the Midwest process, and quality control is always beyond code requirements.

Even if you use only standard fittings, the exceptional quality of Midwest fittings can be important to you. Ask your Midwest distributor or write us for new Bulletin 5801.



36" O.D. 90° elbow with 16" tangent on one end being welded by an automatic submerged arc machine. Material is A-201 carbon steel.

Stainless-clad elbows undergoing ultrasonic inspection to check bonding of material and quality of weld. Since plate is often the only form in which clad material is available, the Midwest process is able to produce the most comprehensive range of clad fittings—and to do so promptly.



Special 24" x 21" 45° reducing elbow made of 1" thick 1¼% chrome ½% moly steel ready for heat treating furnace.

MIDWEST PIPING COMPANY, INC.

Main Offices: St. Louis 3, Mo. (P. O. Box 433)

PLANTS: ST. LOUIS, CLIFTON, N. J. and LOS ANGELES

SALES OFFICES:

Asheville—(Box 446, Skyland, N.C.) • Atlanta 9—72 11th St., N.E.
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8039

WHAT DO YOU THINK?

Opinions and comments on the significant subjects carried in each month's CHEMICAL PROCESSING are important! We *welcome* your letters expressing your views.

Many CP readers are taking the opportunity to state their views on today's top questions.

By publishing your letters in CHEMICAL PROCESSING, others will have the opportunity to hear your side.

Perhaps you agree

with what has been written in these articles.

Maybe you don't.

You might even have a thought or angle which wasn't expressed.

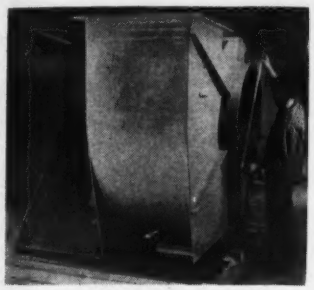
If so, why not let us and others hear your ideas? Suitable letters will be published in our regular "Letters from Readers" column. (See page 7.)

Address your comments to:
The Editor
CHEMICAL PROCESSING
111 E. Delaware Place, Chicago 11, Illinois

For more information on product at left, specify 2386 see information request blank opposite last page.

Large plastic fan handles sulfuric acid fumes

Fan made of glass fiber reinforced polyester was recently placed in service to handle 27,500 cfm of corrosive fumes containing about 1%



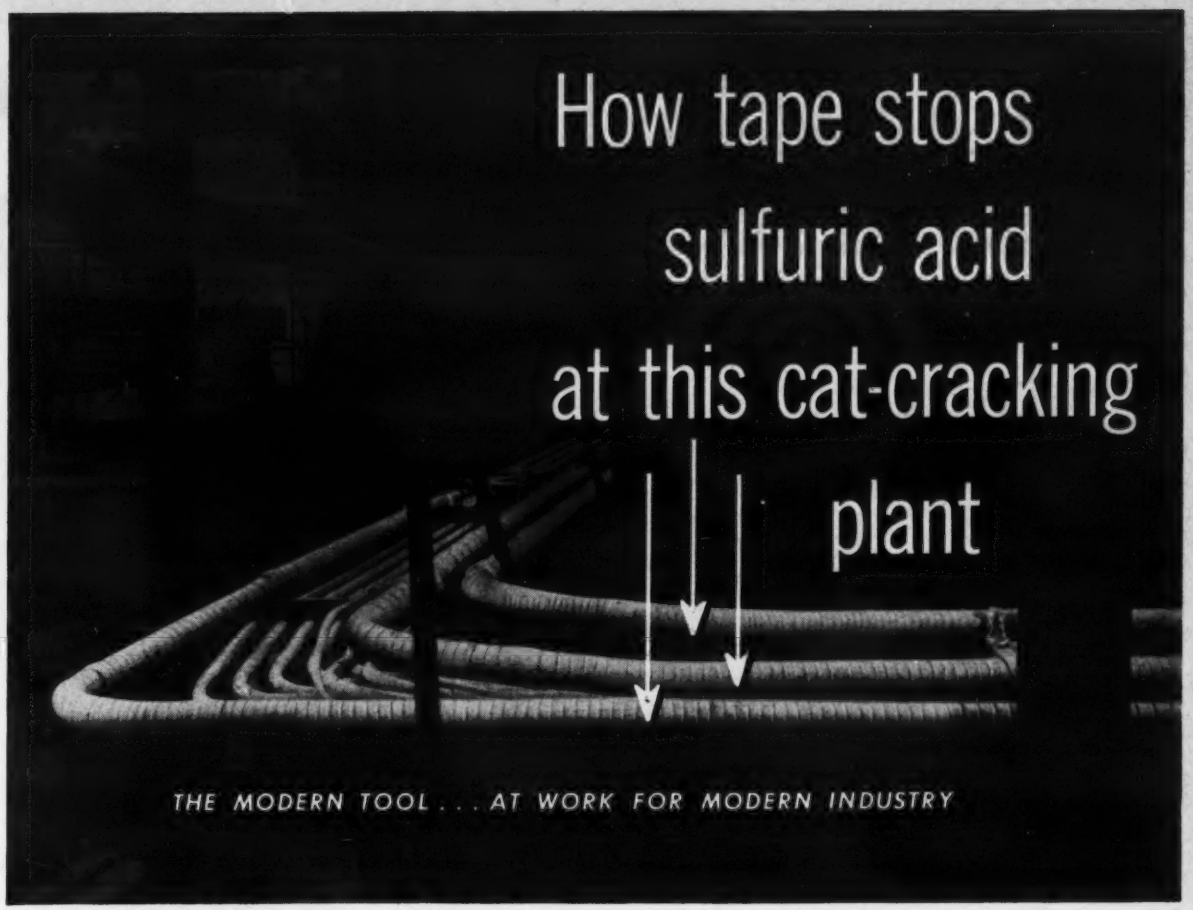
Jumbo plastic fan

sulfuric acid. Fumes are produced by anodizing aluminum. Since all parts exposed to the corrosives are solid plastic, the giant fan is expected to give excellent service in this severe application.

(Rigidon plastic fan is the product of Heil Process Equipment Corporation, 12901 Elmwood Ave., Cleveland 11, Ohio.)

Check 2387 opposite last page.

"The third time's a charm alright . . . you're fired! . . . ."



FIVE YEARS UNDER THESE HIGHLY CORROSIVE CONDITIONS PROVES THAT POLYKEN PROTECTION WORKS . . . *TO TRIM COSTS*

Look in on one of the world's largest fluid catalytic cracking units. A maze of conduit and pipe exposed to an extremely corrosive sulfuric acid atmosphere.

Formerly, these structures had to be painted every three or four months. Maintenance costs were excessive. Then, five years ago, they were wrapped with Polyken Protective Tape Coating. They have needed practically no attention since.

INERT POLYETHYLENE

The reason is that Polyken takes amazingly inert polyethylene and makes it into a tape coating with all these properties.

- **tough and elastic**
- **unplasticized, non-drying film**
- **doubly thick adhesive to seal all voids**
- **far higher adhesion for a true bond to pipe surface**
- **lower water vapor transmission rate**
- **higher electrical insulation resistance**
- **better cold weather handling and durability**

Check the savings. Contact the Polyken distributor in your area.

Atlanta, Georgia: Steele & Associates, Inc.
Chicago, Ill.: Sales Engineering, Inc.
Cincinnati, Ohio: Hare Equipment
Cleveland, Ohio: The Harco Corp.
Denver, Colo.: Patterson Supply Co.
Des Moines, Ia.: The Donald Corp.
Fort Worth, Texas: Plastic Engineering & Sales Corp.
Gretna, La.: Allen Cathodic Protection Co.
Houston, Texas: Cathodic Protection Service
Kansas City, Mo.: Industrial Coating's Engineering Co.
Long Beach, Calif.: Barnes & Delaney
Minneapolis, Minn.: Simcoe Equipment Co.
Philadelphia, Pa.: Harold N. Davis Co.
Pittsburgh, Pa.: Royston Laboratories, Inc.
Plainfield, New Jersey: Stuart Steel Protection Corp.
St. Louis, Mo.: Shutt Process Equipment Corp.
San Francisco, Calif.: Aetna Sales Co.
Seattle, Wash.: Farwest Corrosion Control Corp.
Seattle, Wash.: Pacific Water Works Supply Co.
Tulsa, Okla.: William Cluff Corp.

Polyken®
Experienced in modern PROTECTIVE COATING
THE KENDALL COMPANY
Polyken Sales Division

Check 2388 opposite last page

NO DANGER

FROM ACID AND SOLVENT SPRAYS

CHEMPRO
EXTERNAL
MECHANICAL SEAL

- Installed in 20-30 minutes.
- Stuffing box pressures to 35 psi.
- No mounting gland.
- Flushing, cooling and/or lubricating can be supplied on all seals.

CHEMPRO is the only EXTERNAL mechanical seal with seal faces located *inside* the pump stuffing box. This eliminates hazardous spray conditions existing with ordinary seals whose faces are outside the stuffing box.

Unlike internal seals, the CHEMPRO is *never completely immersed in the pumping liquid.* Seal faces are adjustable EXTERNALLY by single set screw arrangement—without dismantling the seal or pulling pump shaft.

Write for Chempro Seal Bulletin CP551.

CHEMICAL & POWER PRODUCTS, INC.
The Original Fabricators of Teflon Packings and Gaskets
9 Broadway, New York 4, N. Y.

Check 2389 opposite last page

CEILCOTE E-900

...PROTECTIVE COATING FOR:

STRUCTURAL STEEL . . . TANK EXTERIORS . . . WATER TANK INTERIORS . . . TANK TRUCK EXTERIORS . . . STACKS . . . EXHAUST FANS . . . CONCRETE PIERS FOR PLATING FOUNDATIONS . . . FLOORS UNDER STORAGE TANKS . . . BUILDING WALLS . . . PIT WALLS.

E-900 is truly an outstanding coating. It provides unusual resistance to a wide variety of chemicals, acids, alkalies and solvents.

IN MOST INSTANCES, E-900 OFFERS THE SAME PROTECTION AFFORDED BY UP TO TEN COATS OF CONVENTIONAL PAINTS.

New coating can be applied by brush or roller coat after addition of a hardening agent. Because of high solid content, 95% of applied thickness is converted to protective film.

E-900 is an exclusive development of CEILCOTE . . . a name long recognized as leader in the corrosion industry.

Write today for TECHNICAL BULLETIN E-900

CEILCOTE E-900 CEILCOTE

7921-CC

another product of
THE CEILCOTE COMPANY, INC.
4834 Ridge Road • Cleveland 9, Ohio

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Check 2390 opposite last page

Zirconium stands up under boiling HCl in recent tests

Film formations further enhance low corrosion rate

In an exhaustive series of short-term and long-term tests, it was shown that the maximum corrosion rate of zirconium in boiling 20% hydrochloric acid is about 4.5 mils per year. This excellent corrosion rate is further improved with oxide films normally present on the surface of zirconium and made still better when conditions are such that hydride films are formed.

In the investigation, on short-term (144 hour) tests, specimens of zirconium were subjected to differing surface treatments prior to immersion in boiling hydrochloric acid. Results suggested that factors involved in film formation play a dominant role in the corrosion behavior of zirconium. Long-term tests (2000 hours) revealed two general types of protective films. One of these is a primordial zirconium oxide film, and the other is a face-centered cubic zirconium monohydride film.

Oxide film is subject to failure by a "breakaway" mechanism involving the formation of an interfacial hydride layer at the oxide-metal interface which eventually causes the protective film to suddenly loosen and break away. Corrosion rate is practically nil before "breakaway" and only 3 to 4.5 mils per year afterwards.

Protective hydride film is highly sensitive to surface preparation. Electrolytically polished specimens produce dense films which are quite resistant to boiling hydrochloric acid.

Results of research suggest that alloying and surface treatments may be developed that will favor the formation of these films on the surface of zirconium and further improve its already excellent corrosion resistance in hydrochloric acid. Efforts are being directed toward the use of the less costly commercial grade of zirconium containing 2.00-2.50% haf-

ENGINEERS "DISCOVER" ALCOA CONDUIT

Lower cost, installation economies, corrosion resistance make Alcoa Aluminum the best conduit buy

An increasing number of cost-conscious engineers are switching to aluminum rigid conduit for office buildings, industrial plants and other new and remodeled structures. Here are some of the reasons why:

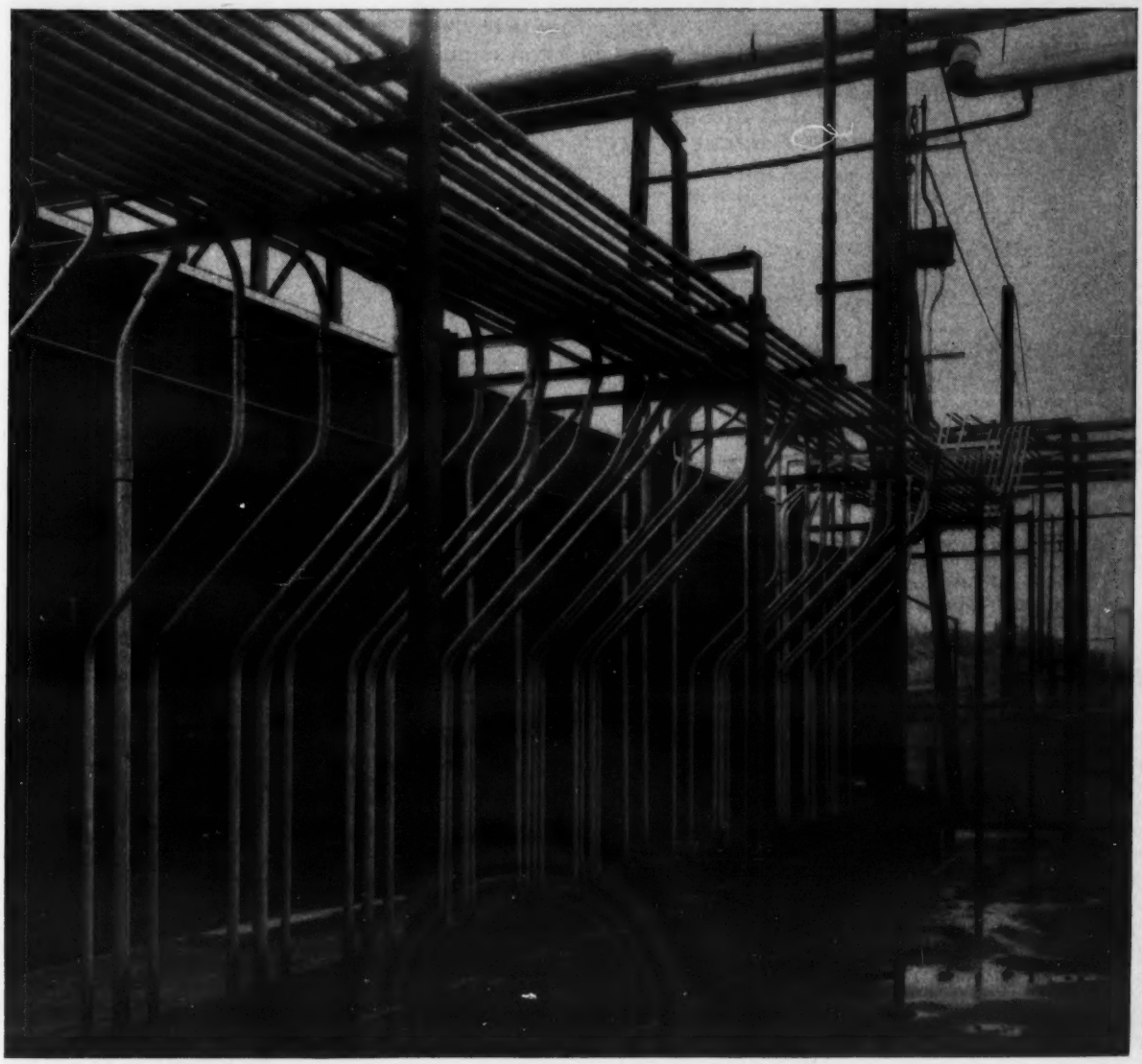
- Lower prices plus light weight and ease in handling make Alcoa Aluminum Conduit installations competitive.
- Corrosion resistance of aluminum means less maintenance, freedom from staining.
- Aluminum is easier to cut, bend and thread. Wire pulling is easy, too, because of specially treated internal surface.
- Nonmagnetic aluminum offers up to 20 per cent less voltage drop.
- Clean, modern appearance complements modern architecture.
- Aluminum is nonsparking and has Underwriters' Laboratories, Inc., approval.

Find out why Alcoa® Aluminum is your best conduit buy. Contact your electrical distributor, or write Aluminum Company of America, 2323-L Alcoa Building, Pittsburgh 19, Pennsylvania.

Your Guide to the Best in Aluminum Value

ALCOA THEATRE
Fine Entertainment
Alternate Monday Evenings

Spencer Chemical Company, Pittsburg, Kansas



Check 2391 opposite last page

there's a PHENOLINE protective system for every plant requirement...with excellent acid, alkali, solvent resistance...fast curing.

1 *SEVERE CORROSION • HEAVY TRAFFIC*

For severe chemical conditions: splash, spillage, heavy chemical attack. Also for heavy foot and truck traffic. Non-skid properties. Long-wearing.

SYSTEM: Prime coat—Phenoline 300 Orange
Top coat—Phenoline 300
Total Thickness (trowel): ⅛ inch

2 *SEVERE CORROSION • LIGHT TRAFFIC*

For severe chemical conditions, but little trucking or other heavy traffic: e.g., beneath tanks and equipment.

SYSTEM: Prime coat—Phenoline 300 Orange
Intermediate coat—Phenoline 302
Top coat—Phenoline 300
Total Thickness (brush or spray): 1/2 inch

3 *LIGHT CORROSION • LIGHT TRAFFIC*

The economy coating for less severe conditions of corrosion and traffic. Non-skid properties. Easy to apply. Hard, tough protection.

SYSTEM: Prime coat—Phenoline 305 Primer
Top coat—Phenoline 305
Total Thickness (brush or spray): 25 mils

FREE . . . Sample panels of each system, on request. Write for complete details and recommendations for your service.

ANNOUNCING NEW PHENOLINE CONCRETE PRIMER *for damp concrete which cannot be completely dried prior to application. Provides a tight bond for Phenoline top coats in all three systems.*

SALES OFFICES:
Atlanta, Buffalo, Denver, Detroit, Houston, Los Angeles, Mobile, New York, Pittsburgh, San Francisco, Tampa, Tulsa, Toronto, other leading cities.

carboline COMPANY
Specialists in Corrosion Resisting Synthetic Materials
32-B Hanley Industrial Ct.
St. Louis 17, Mo.

Check 2392 opposite last page

nium. This alloy is equal in corrosion resistance to the reactor grade metal containing less hafnium. Low carbon content of zirconium is important for maximum corrosion resistance.

(Condensed from technical paper, "The Corrosion of Zirconium in Hydrochloric Acid at Atmospheric Pressure," which was presented at the 1958 Annual Meeting of the National Association of Corrosion Engineers in San Francisco. Paper was prepared by W. E. Kuhn, Supervising Engineer, Research & Development Div., The Carborundum Co., Niagara Falls, N.Y.)

Check 2393 opposite last page.

Glassed-steel vessels easily checked by electronic tester

Detects surface breaks in protective glass

Uses: As non-destructive glass tester of surface continuity in glassed-steel equipment used in highly corrosive applications.

Features: Electronic glass tester easily detects surface breaks in the protective glass coating without any danger of harming the glass.

Electronic glass tester detects surface defects

Description: Complete electronic tester consists of control cabinet with direct reading meter on case, 25-ft probe cord, translucent handle containing indicator light, and both brush and pointed probes.

Testing procedure consists of methodically sweeping probe over all glassed surfaces. Brush probe permits rapid testing of open areas. Pointed probe is for use in valves, nozzles, other restricted places. When defect is detected, neon light glows.

(Pfaudlertron is product of The Pfaudler Co., Div. of Pfaudler Permutit, Inc., 1068 West Ave., Rochester, N.Y.)

Check 2394 opposite last page.

Heat transfer tester accurately predicts corrosion rates

Test apparatus recently placed in the new Corrosion Research Laboratory of The Carpenter Steel Company is said to predict the corrosion rate of metals used for heat transfer equipment more accurately than previous methods available.

Corrosion rates are more accurate than those obtained through standard boiling tests for two reasons: 1) sample is held at a temperature different from that of the solution, thus representing the actual relationship between the

Heat transfer corrosion testing equipment at Carpenter Steel

metal walls of the heat exchanger and the corrodent handle, and 2) edge effects are eliminated because the sample is exposed only on the surface. This factor is important, since the edge is rarely exposed to corrosion attack in actual service.

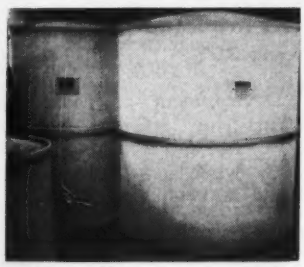
In test method a small sample is clamped over an opening in a glass vessel. This sample is electrically and externally heated so that the heat is transferred through the sample and to the corrode contained in the vessel. Solution concentration is main-

tained by means of a reflex condenser and control of pressure within the glass vessel. Temperature of solution is regulated by an auxiliary heating element surrounding the glassware. Temperature of sample is maintained independently of the solution temperature by controlling heat input from external heat source.

Stainless steel fittings for pipe and tube are covered in detail in 86-page catalog. Corrosion resistance data, welding methods, and specifications are included. "Stainless Steel Fittings" — letterhead request to Ladish Co., Cudahy, Wis.

Reinforced plastic tanks resist most corrosives

Most corrosives — including acids, formaldehyde, alum, bleaches, saline solutions and



Reinforced plastic tanks are being successfully used by a number of large chemical companies

solvents — are withstood by polyester resin tanks reinforced with glass fiber. Tanks are available in sizes from 110 to 4000 gallons.

(Reinforced plastic tanks are product of Jones & Hunt, Inc., P.O. Box 821, Rust Island, Gloucester, Mass.)

Check 2395 opposite last page.

Penton-lined valves are discussed in four-page bulletin. Considerable information is given on corrosion resistance of the chlorinated polyether plastic, which is used for lining the diaphragm valves. This plastic has outstanding corrosion resistance to a wide range of chemicals up to 300°F. Bul 114 — Hills McCanna Co., 4600 Touhy Ave., Chicago 46, Ill.

Check 2396 opposite last page.

B.F.Goodrich

How Koroseal helps cut cost of nickel-plating jewelry

THE Victory Polishing and Plating Company of Providence, Rhode Island specializes in the nickel-plating of jewelry, turning out such items as nickel-plated cuff links, tie bars, necklace chains and pins. The nickel solution used is highly corrosive and runs at an almost constant 130°F. Ordinary "acid-resistant" hoses continued to fail—they couldn't take the combined assault of corrosion and heat.

Then, in the summer of 1956, the company installed B.F.Goodrich Koroseal rigid polyvinyl chloride pipe. Result: absolutely no maintenance is required, and close examination shows no apparent wear. This company is replacing all of its "acid-resistant" hose with Koroseal pipe, and has lined all its acid storage tanks with rigid Koroseal PVC plate.

Versatile Koroseal has answered countless problems for alert manufacturers. Koroseal is unaffected by most alkalies and acids, and is completely inert in the presence of oil, alcohol, and salt solutions.

Exceptionally easy to install, Koroseal PVC can be threaded, cut, welded or drilled. It has excellent insulation properties, will not support combustion, and never needs painting.

Find out how this light, inexpensive, long-wearing pipe can make your operations more efficient. Fill in and mail the coupon on the right. *B.F.Goodrich Industrial Products Company, Marietta, Ohio.*

B.F.Goodrich

INDUSTRIAL PRODUCTS CO.
MARIETTA, OHIO

B.F. Goodrich Industrial Products Co.
Dept. CP-11, Marietta, Ohio.

Please send me free booklets on:
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☐ Rigid Koroseal Sheet

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Koroseal —T.M.Reg. U.S. Pat. Off.

Check 2397 opposite last page

The Answer to your toughest tank lining problems

TYGON

flexible – plastic

•

TOPS IN CORROSION-RESISTANCE

PROVEN in hundreds of the toughest possible applications during the past eighteen years, flexible Tygon plastic tank linings offer more value today than ever.

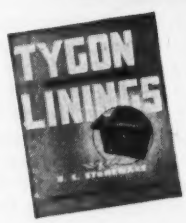
Greater toughness; even better chemical resistance, particularly to chromic and other highly oxidizing acids; longer life.

This better Tygon lining (Formulation 105-A) represents a major step forward in the development of heavy duty plastic sheetings for corrosive service. Tygon linings are now extruded, not calendered. They are completely free of "laminations" — cannot "peel" in service. Under continuous immersion these better Tygon linings show negligible extractibility.

Available in 3/32" and 3/16" thicknesses, Tygon can be installed by strategically located licensed applicators quickly and inexpensively.

For that next "tough" tank lining problem — ask for, insist on — TYGON.

311F



This booklet tells the "down-to-earth" facts about Tygon. Where and how to use it. When not to use it. A valuable reference for every engineer faced with corrosion problems. Free on request. Write for your copy today! Ask for Bulletin TL-526-R. Address: Plastics & Synthetics Division, The U. S. Stoneware Co., Akron 9, Ohio.

U. S. STONEWARE

AKRON, OHIO

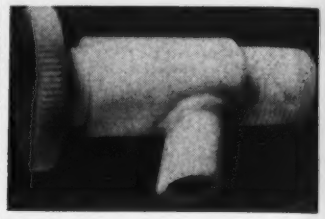
Tygon is the registered trade-mark of The U. S. Stoneware Co.

Check 2398 opposite last page

CORROSION CONTROL

Polyethylene faucet announced

Drain faucet is announced to be made of polyethylene, branch polyethylene and linear polyethylene. Faucet, which is



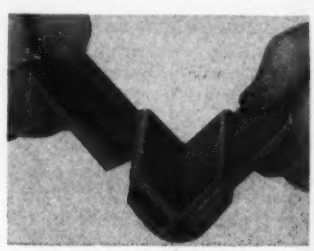
¾" in size, is suitable for draining corrosive liquids from various containers.

(Polyethylene faucet is product of American Agile Corp., P.O. Box 168, Bedford, Ohio.)

Check 2399 opposite last page.

PVC joining method cuts fabrication costs 30%

Development of joining strips for solvent welding PVC is said to reduce costs 30% when plastic is fabricated into tanks, ducts, etc.



Ninety degree joining strip for making corner. PVC sheet at right is held in strip by solvent. Sheet at left is being inserted into joining strip

Two shapes of joining strips are available, 90° strips for making corners and H strips for use in a single plane. Strips fit tightly at outside edge to provide clamping pressure.

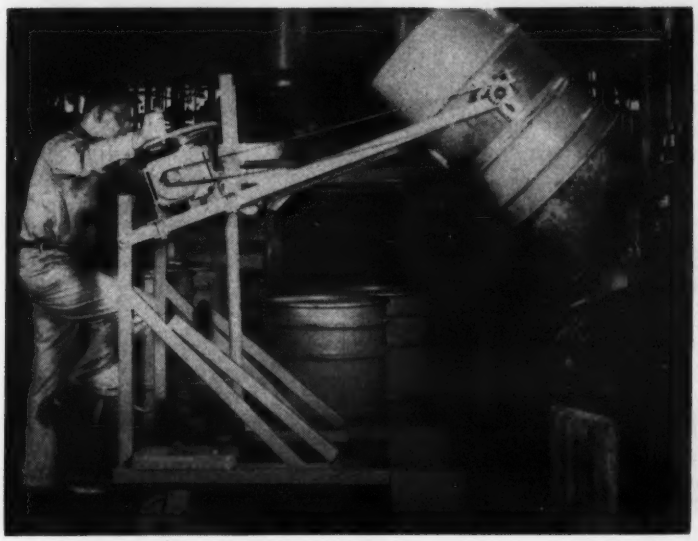
(PVC joining strips are product of The Colonial Plastics Manufacturing Co., 2685 East 79th St., Cleveland 4, Ohio.)

Check 2400 opposite last page.

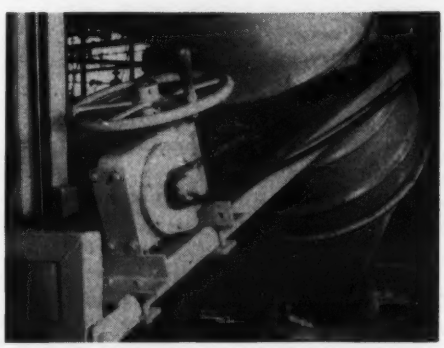
In order to eliminate dust hazards to operator when charging fluffy material to reactors, Hoffmann-LaRoche adapted a gear-reduction box to tilting device and . . .

Gets controlled pouring with hydraulic drum lift

CP EDITORIAL STAFF
with H. VAN TILBURG, Technical Development Dept.
Hoffmann-LaRoche Inc., Nutley, N. J.



Addition of gear-reduction box to tilting device of hydraulic drum lift has enabled Hoffmann-LaRoche to eliminate dust problems that can occur when charging fluffy sodium methylate to reactors



Close-up of gear-reduction box which Hoffmann-LaRoche installed on standard unit to give controlled pouring. Manufacturer of drum lift has incorporated device in later models. Device assures self-locking and absolute control at any pouring angle

PROBLEM: Charging fluffy sodium methylate to reactors can cause some pretty serious dust problems. To minimize these problems, Hoffmann-LaRoche, who uses the material in their "Gantrisin" (a water-soluble sulfa drug) process, had been dumping the material from drums into overhead chutes which fed into reactors. However, when the production of "Gantrisin" was expanded and more units were added, installation of additional chutes was impossible where head room was limited.

To charge these added reactors, a yoke on a chain block was installed to pick up the drum and hold it over charging port. Operators would then tip drum to dump contents. However, any sudden surge of material would present dust hazards to these men. Also the procedure usually took three men to charge a reactor.

Solution: Hoffmann-LaRoche ordered a modified hydraulic drum lift with arms lengthened 12″ to facilitate handling of drums in crowded areas. Suitable counter-balance was added to rear of lift for stability. Unit is constructed of square steel tube. It has these overall dimensions: 49″ long, 56½″ high, 38″ wide. It is equipped with 8″ sparkproof wheels.

Lifting capacity is 750 lb. Drums are raised to height of 67″ in matter of seconds by foot-actuated hydraulic jack.

To reduce dust during dumping operation, Hoffmann-LaRoche fabricated a suitable pouring chute that attaches to drum with drum clamp. Chute is offset from center to assure complete emptying, and is designed to fit into mouth of reactor.

Company engineers also installed a gear-reduction box on unit to get better pouring control and to further cut dust to a minimum. Gear box is totally enclosed, is connected to tilting device by chain, and assures self-locking and absolute control at every pouring angle. Consequently, once operator has attained proper angle for good, dustless pouring rate, he can remain away from the pouring operation.

Results: One of the units at Hoffmann-LaRoche (they now have two) has been in operation over two years. To date, no maintenance other than checking hydraulic fluid has been necessary.

The controlled-pouring device has minimized dust hazards to operator. In addition, great savings have been realized since one man now handles operation that previously required three men.

Operation is safer, too, since operator is required to handle drum only when initially engaging it in lift and taking it off when it is empty.

Controlled-pouring arrangement worked out so well in this installation that the drum-lift manufacturer has adapted it on one of their standard models now being produced.

(Model CP-1 hydraulic drum lift, with controlled pouring, is manufactured by Sterling, Fleischman Company, PO Box 94, Broomall, Pa.)

Check 2401 opposite last page.

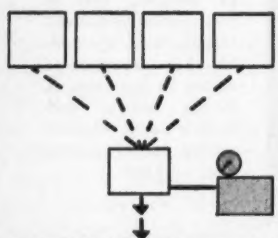
PUSH BUTTON BATCHING

BATCHMASTER speeds chemical processing

At last, completely automatic one-man batching for you. Batchmaster is the simple, speedy system for precise mixing of multiple ingredients to any desired formula. Accommodates all materials — solid, powdered, granulated, liquid. Provides *continuous* automatic control of all ingredients by weight. Boosts production, improves quality control, eliminates waste.

No need for expensive, complex custom installations. Howe engineers *standard* Batchmaster systems tailored to your operation. Guarantees proper batching for most critical formulas. Cuts operating costs. Provides better control of material costs. Rugged construction for extreme operating conditions. You have a *different* batching problem? Send for detailed booklet illustrating the Batchmaster solution.

Simply dial the formula and mixing times, select number of batches, and press start button. Any number of ingredients are automatically fed, weighed, mixed and discharged.



Write for Complete Details

HOWE

THE HOWE SCALE CO. · RUTLAND, VERMONT
A SUBSIDIARY OF SAFETY INDUSTRIES, INC.

Check 2402 opposite last page

Gear drive departure improves handling of electric trucks

Uses: For in-plant transportation of materials.

Features: Gear drive, which is completely redesigned, features total enclosure, with gears revolving in constant bath of oil. Gear drive is constructed as single piece unit, with motor, transmission, and drive wheel mounted in balanced vertical column. Smooth acceleration is assured by adjustable time-delay mechanism through four speeds forward and reverse — prevents jerking trailers from standing start.

Description: Redesigned series of electric tractors has power furnished by specially designed high-torque motor with 24-volt battery. All control and power leads are stationary, with no flexible current conductor to weaken and wear.

Radical improvement in gear drive gives electric tractor smooth performance

Operator has comfortable standing position on platform 7" from floor level. Dual controls for braking and acceleration are conveniently located on steering handle, and can be operated with either right or left hand.

Internal expanding-type 7" diam automotive brakes assure quick stops. Standup riding model has speeds of 6¼ mph without load, 3¼ mph with maximum rolling load. Drawbar pull is 550 lb.

(SX-24 standup riding model is product of Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.)

Check 2403 opposite last page.

Now... a Powerful New TUBAR DUMPER Specially Designed for Bulk Chemical Containers

The new Tubar Twin-Cylinder Dumper is designed for all-purpose service in paint plants . . . pharmaceutical houses . . . granular plastics . . . and everywhere bulk chemicals are handled. It's built for years of rugged, heavy-duty service . . . cuts chemical container handling costs to the bone. Write for full information and operating specifications.

- **Most models can be made portable**
- **Stops and holds loads at any point in dumping cycle**
- **Optional splash-proof and explosion-proof power features**

UHRDEN is serving industry with a full line of all-purpose and special-purpose dumpers. Standard production models . . . or built to your specifications.

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U-158-39A

Check 2404 opposite last page

Rigid support framing is eliminated in conveyor idler

Quick, simple installation; costs, maintenance cut

Uses: For handling bulk materials.

Features: By suspending flexible idlers between parallel stringers of steel wire rope, rigid support framing is eliminated. This results, according to manufacturer, in lower costs, quick, simple installation, and reduced maintenance. System has fewer parts than conventional units, and is much lighter. Re-location and any extensions are comparatively easy.

Description: Belt conveyor usually consists of two parallel strands of wire rope stretched between widely separated anchor points. Rigid stands with integral return idlers support ropes every 12 to 40', depending on load. Conveyor-carrying idlers are swivel-mounted in rigid brackets and slung between ropes. Hand screws secure all components.

Idler consists of series of neoprene discs molded to neoprene-covered cable suspended in a catenary between two sealed and lubricated bearings. Belt is supported in natural arc. Idlers are free to flex and swivel, conforming to load as belt passes over them. Rigid brackets keep rope stringers parallel and aligned.

Resilient and flexible idler is said to improve belt life through absorption of load shock and more efficient support. Cushioned ride eliminates spillage and generally improves load handling.

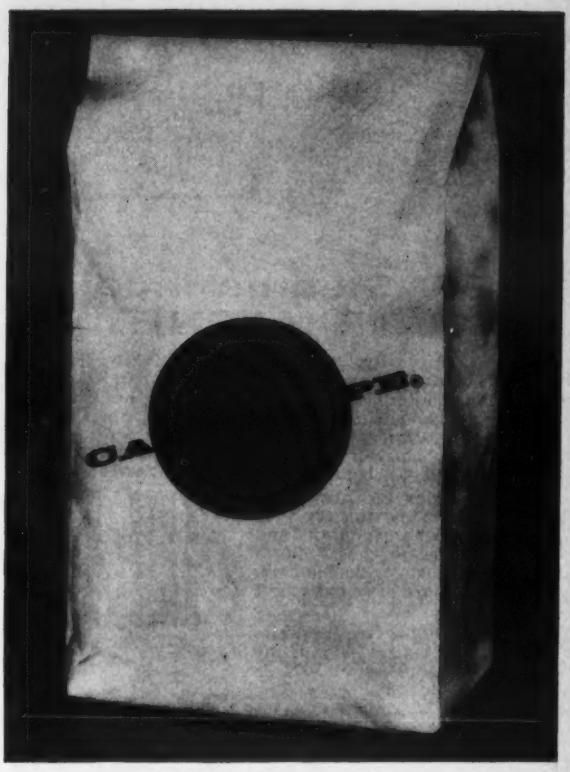
(Limberope belt conveyor is product of Joy Manufacturing Company, Henry W. Oliver Building, Pittsburgh 22, Pennsylvania.)

Check 2405 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Packaging Formula Not Found in Books Solves "Problem" Products' Shipment, Storage, Display

$$\sqrt{\frac{KC}{YPP + x^n + x^n}}^{*}$$



We love tough packaging problems — and for over 40 years have been successfully solving them! And with "Canvelope" we believe we can lick your toughest assignment. It is an ideal container for products having extreme fineness, high specific gravity and/or sensitivity to moisture change, i.e., powdered and moist chemicals, semi-solid and solid.

What makes us so confident? Nothing but our own experience and users' glowing tributes to "Canvelope" — and for good reasons . . .

It's as tough as a tin can, yet flexible as a bag. It's air-tight and leak-proof — will not allow moisture to creep in nor its contents to seep out. It is ideally suited to packaging materials where change of atmosphere or chemical nature generally cause short life or spoilage. Its inert plastic coated aluminum lining assures complete safety against such hazards.

Furthermore, it packs and travels easily; and its exterior surface is ideal for imprinting your own sales-stimulating design. In a word, "Canvelope" *is* the word. Why not look into it today by filling in and mailing the coupon below. We'll send you the confidential facts and samples r-u-s-h! Fair enough?

* Solution to the above formula is this: Kehr "Canvelope" over your Packaging Problem plus unknown factors of infinite variety, plus more of the same, equals the square root of just what you are looking for.

Kehr PRODUCTS COMPANY

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Designers and Manufacturers of: Bags, Pouches, Tubing, Canvelopes, Sheets and Rolls from Flexible Films, Foils, and Papers printed by the Flexographic or Rotogravure Processes.

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Please rush me the confidential facts, figures and sample of "Canvelope."

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Company_____

Address_____

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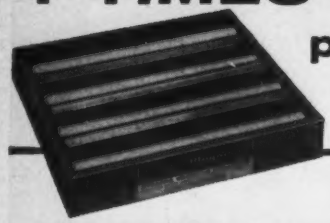
Check 2406 opposite last page

4 TIMES MORE protective surface!



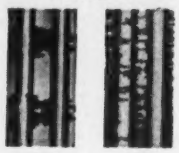
NEW Stearns Indox GRATE MAGNET

The new Stearns Indox Grate Magnet actually presents *4 times more collection surface* to remove tramp iron from free-flowing materials. Here's the secret: the magnetic collecting tubes have *continuous poles* along their entire length — no dead spots where iron particles can slip past (see comparative photos, below right).

Stearns Indox Grate Magnet is available in a wing type for hopper or floor installation, and a drawer type for closed chutes and ducts. Single or double-bank models, standard sizes to fit most requirements.

Write today for free literature on the new Stearns Indox Grate Magnet. Ask for Bulletin 1072-P.

TYPICAL COLLECTION PATTERNS



Ordinary Grate Magnet | Indox Grate Magnet

STEARNS MAGNETIC PRODUCTS
A DIVISION OF THE INDIANA STEEL PRODUCTS COMPANY
635 South 28th Street • Milwaukee 1, Wisconsin

Check 2407 opposite last page

WANT ANTI-CORROSIVE DRYER TRAYS?

USE TOTELINE TRAYS OF FIBER GLASS REINFORCED PLASTIC

Toteline trays resist non-oxidizing acids, corrosive salts, weak alkalies and many other chemicals. And when Toteline trays resist a material, they are not attacked at all!

- No Maintenance
- Easy to Clean
- Lightweight
- Faster Drying

15 Standard sizes from 8¼" to 25⅝" to 24" x 48".
Write for complete information.

TOTELINE LINESVILLE, PA
World's largest producer of fiber glass reinforced plastic trays and toteboxes
Offices in principal cities and Canada

Check 2408 opposite last page

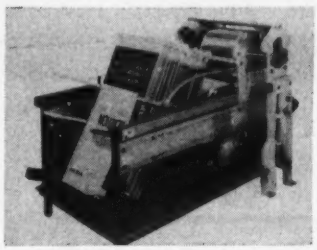
HANDLING & PACKAGING

Bag inventory eased and kept up-to-date by bag printer

Unit can handle up to 20 multiwall bags/minute

Uses: Imprinting multiwall bags in the plant.

Features: Bag printer eliminates pre-printing and bag



Plant prints own bags to avoid obsolescence and cut inventory

obsolescence, thereby simplifying inventory.

Description: Unit feeds and prints up to 20 multiwall bags per minute. Magazine holds 250-300 bags. Printer can be operated intermittently as well as automatically and continuously. It holds register accurately. Units can be supplied to fit a single bag size, or made adjustable for moderate variation in bag size.

(Bag Printer is a product of Industrial Marking Equipment Company, 655 Berriman St., Brooklyn 8, N.Y.)

Check 2409 opposite last page.

Opens, dumps bags— big labor savings for large users

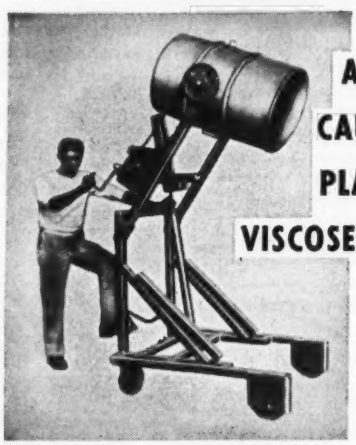
Uses: Unit is designed for opening and dumping multiwall bags.

Features: Twenty 100-lb bags per minute can be opened and dumped by unit, providing large users of multiwall bags with high labor savings.

Description: Bags to be opened are conveyed up an incline by flat wire-mesh conveyor, pass under and are sliced in half by rotating disc knife, and dumped into hopper below. Prior to being sliced in half, two ends of bag are impaled on two elongated spikes

Check 2410 opposite last page

CONTROLLED POURING



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VISCOSE MATERIALS

with the Model CP-1 Sterling Hydraulic Drum Lift. Be assured of self-locking and absolute control at any pouring angle.

Lifting capacity 750 lbs. Lifting height 72". For complete details and specification on the CP-1 model and other model Sterling Hydraulic Drum Lifts, write: Dept. F-811

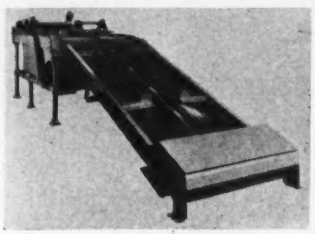
STERLING, FLEISCHMAN COMPANY
P. O. BOX 88 BROOMALL, PA.

Check 2411 opposite last page

which prevent the bag halves from falling into hopper along with contents.

After dumping, two bag halves are transported along spikes to rear of machine where they are cut off and ejected to an exit conveyor.

Welded-steel structure and adjustable tubular-steel supports make up framework. Inclined conveyor is directly powered by ½-hp 220/440-volt three-phase gearhead motor. Bag slitting knife, bag half



Machine which opens and dumps twenty 100-lb bags per minute is big labor saver for multiwall bag users

transporter, and knives to cut bag halves from spikes are chain-driven by ½-hp 220/440 volt three-phase motor.

Overall dimensions are: 18′ long by 4′ wide and 4′ high. However, unit may be produced to any dimensions with variable capacities to fit requirements of application.

(Bag slitter is product of Wiretyer Corp., 65 Leliarts Lane, East Paterson, N. J.)

Check 2412 opposite last page.

Elevator-like truck body cuts loading time, increases safety

Raised, lowered hydraulically

Uses: For loading or unloading at various platform heights.

Features: Unit is said to reduce loading time by 1/3, and increase safety of operation by protecting employees from loading and unloading injury. Turn-around time of delivery can be considerably increased.

Description: Truck body operates like an elevator, with hydraulic cylinders to raise and lower it. Complete unit has front wheel drive, using either an International model AC-180 cab forward unit or a Jeep FC-170 cab forward unit, to obtain its power.

Rear wheels are attached to hydraulic levers — are in a

Fast, safe, hydraulic control raises entire truck body to any height up to 52"

diagonal position when trailer is up, but lowered to horizontal position when it comes down. When unit is lowered, rear wheels, in effect, are retracted into wheel housing, as an airplane landing gear is retracted.

Front of unit moves up and down in vertical guide mounted on truck cab, similar to "mast" of fork lift truck. Mast connects cabin body and

Truck body can be lowered so that floor is level with curb. Loading or unloading can be done from either side or from rear

holds front of unit in position during ups and downs.

Over the road, unit rides at conventional height of 24" resting on chassis springs attached to rear axles and held in position by mechanically actuated locking pins, activated through chassis rails.

(Leveloder is product of Thompson Trailer Corp., Subs. of General American Transportation Corp., 2 Old Court Rd., Pikesville 8, Md.)

Check 2413 opposite last page.

Richardson recommends

4 WAYS TO SAVE WASTED BAGGING DOLLARS

1. **Minimize Weight Give-Away.** Frequently, you're forced to set mean bagging weights high, to prevent falling short. With an inaccurate scale, you can lose more than $10 an hour through weight variations—especially when bagging at high speeds. Many processors have solved this problem by installing Richardson bagging scales. With average accuracy of ± 1 to 2 oz. or better, they prevent overweights and underweights, year after year.
2. **Spend Less for Bags.** You may be paying good money for nothing but "air space" in filled bags. A Richardson G-73 Impacker can end this waste. The Impacker is a simple, compact accessory that quickly "shakes down" material as it fills bags. Thus, you can pack any given quantity into smaller, neater bags. The money you save—on bag size alone—can bring you profits well beyond the cost of this equipment.
3. **Speed Up Production.** Example: the Duplex Richardson E-50 Bagging Scale can turn out twenty 100-lb. bags per minute. It's only one of many Richardson models for handling flour, sugar, rice, feed, and chemicals, in bagging ranges of 25-250 lbs.
4. **Cut Excessive Labor Costs.** Are your bagging operations overmanned? Some installations require expensive standby labor. You can cut out this cost—sometimes as much as one-third of regular labor costs—and free labor for productive work, by installing *automatic* Richardson bagging equipment. Time and labor-saving accessories include automatic feeders, sewing conveyors and pedestals, bag-holders, as well as packers like the Impacker described above. Low-cost automatic proportioning systems are Richardson specialties, too. Simple design makes maintenance easy. Any maintenance man can understand a Richardson. And, *only* Richardson maintains a nationwide service organization that can serve you *within 24 hours,* if necessary.

Richardson Scales conform to U. S. Weights and Measures H-44 for your protection.

FOR MORE INFORMATION ON RICHARDSON BAGGING SCALES, WRITE TODAY TO

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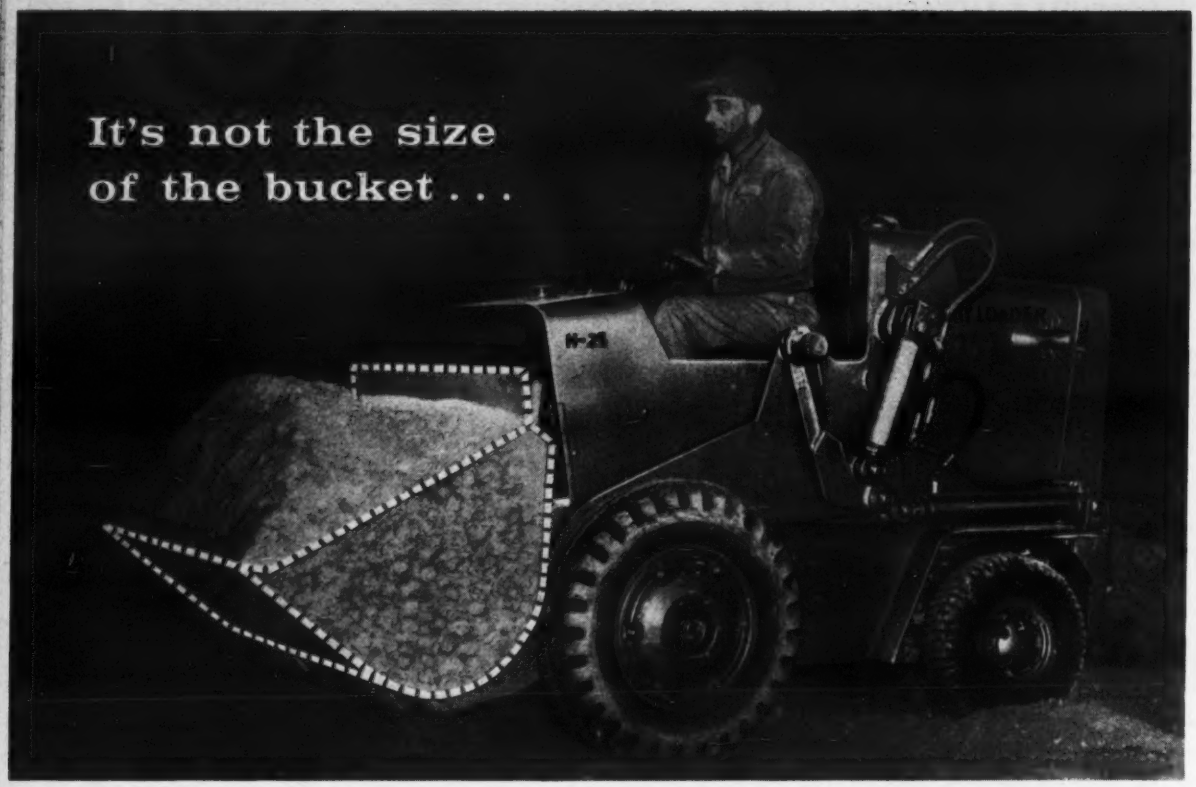
MATERIALS HANDLING BY WEIGHT SINCE 1901

RICHARDSON SCALE COMPANY • CLIFTON, NEW JERSEY

Sales and Service Branches in Principal Cities

Also manufactured in Europe to U.S. standards

Check 2414 opposite last page



. . . It's the weight of the load that measures tractor-shovel capacity!

More pounds per load . . . Buying a tractor-shovel on the basis of bucket volume, without knowing the carry capacity IN POUNDS of the unit, is putting the cart before the horse. You may be getting too much bucket, or not enough, for handling *your* materials most efficiently.

Buying on the basis of lifting capacity can be equally misleading since any tractor-shovel can lift much more than it can carry. However, it is the number of pounds which can be moved safely at normal speeds, in relation to the weight of the material to be handled, which determines the proper bucket size.

The carry capacity of the new model H-25 "PAY-LOADER" is 2,500 lbs. This is equal to 40% of the total machine weight and represents a new high in Capacity-to-Weight ratio for a unit of this class.

It is easy to select the proper bucket size which will enable you to safely move the largest load of *your* materials with an H-25 by referring to the table below.

FOR MATERIAL WEIGHING	BUCKET SIZE (S. A. E. RATED)	H-25 CARRY CAPACITY
up to 90# per cu. ft.	1 cu. yd.	2,500 lbs.
up to 105# per cu. ft.	⅞ cu. yd.	2,500 lbs.
up to 125# per cu. ft.	20 cu. ft.	2,500 lbs.
up to 155# per cu. ft.	16 cu. ft.	2,500 lbs.
up to 190# per cu. ft.	13 cu. ft.	2,500 lbs.

More loads per shift . . . The new H-25 "PAY-LOADER" not only handles a big load for its size and weight, but has the speed, maneuverability and ease of operation which permits it to move more loads per shift. Features which make this extra productivity possible are full-reversing, power-shift transmission with two speeds forward and two reverse; torque-converter drive; power-steering; power-transfer differential which automatically shifts more torque to the wheel with the best traction, and fast, powerful hydraulic bucket control.

Your "PAYLOADER" distributor will be glad to show you why you get more for your money in the model H-25 and other "PAYLOADER" units. Ask him about Hough Purchase and Lease Plans too. If you are interested in more information on the H-25, write to The Frank G. Hough Co., 744 Sunnyside Ave., Libertyville, Illinois.

Modern Materials Handling Equipment

THE FRANK G. HOUGH CO.

LIBERTYVILLE, ILLINOIS

SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Send data on "PAYLOADER" models

☐ 4-wheel drive ☐ 2-wheel drive

Name.....

Title.....

Company.....

Street.....

City.....Zone.....State.....

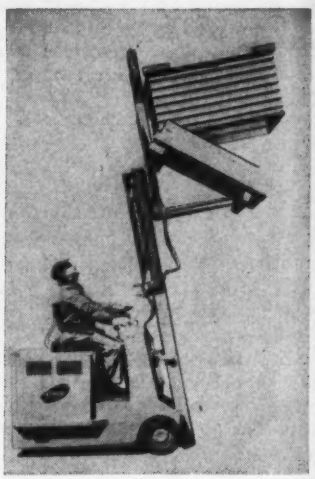
11-A-1

Check 2415 opposite last page

Fast, simple to operate, box dump attachment installed in field

Uses: For handling and dumping drop-bottom boxes.

Features: Attachment is quickly demountable and may be installed in the field. Fast, simple to operate, and fully automatic, it does not interfere with normal handling operations.



Drop-bottom boxes can be loaded quickly for dumping onto floors, conveyors, or into bins, hoppers, freight cars, etc.

Description: Hydraulic box dump attachment is designed for use on manufacturer's fork trucks with capacities from 2000 to 10,000 lb. Unit is easily maintained. Dumping may be accomplished from any elevation.

(Hydraulic box dump attachment is product of The Elwell-Parker Electric Company, 4205 St. Clair Ave., Cleveland 3, Ohio.)

Check 2416 opposite last page.

Material Handling Institute's plans, policies and procedures for serving its member companies are presented in the form of answers to 25 pertinent questions. Handy 16-page pocket-size brochure clearly outlines aims and reasons for The Material Handling Institute's existence. "The Material Handling Institute, Inc. and You" — The Material Handling Institute, Inc., 1 Gateway Center, Pittsburgh 22, Pennsylvania.

Check 2417 opposite last page.

WHY BORROW?

You can receive a personal copy of CHEMICAL PROCESSING every month.
Do you know that the magazine can come to you personally without charge, to your designated address?

If you . . .

would like to receive it and if you qualify, the publisher will add your name to the more than 50,000 key men in the chemical processing industries who receive each issue regularly.
The necessary qualifications are outlined on the request form that can be found opposite the inside back cover.
Fill it out, being sure to give all necessary information, and mail to Reader Service Department.

Perhaps . . .

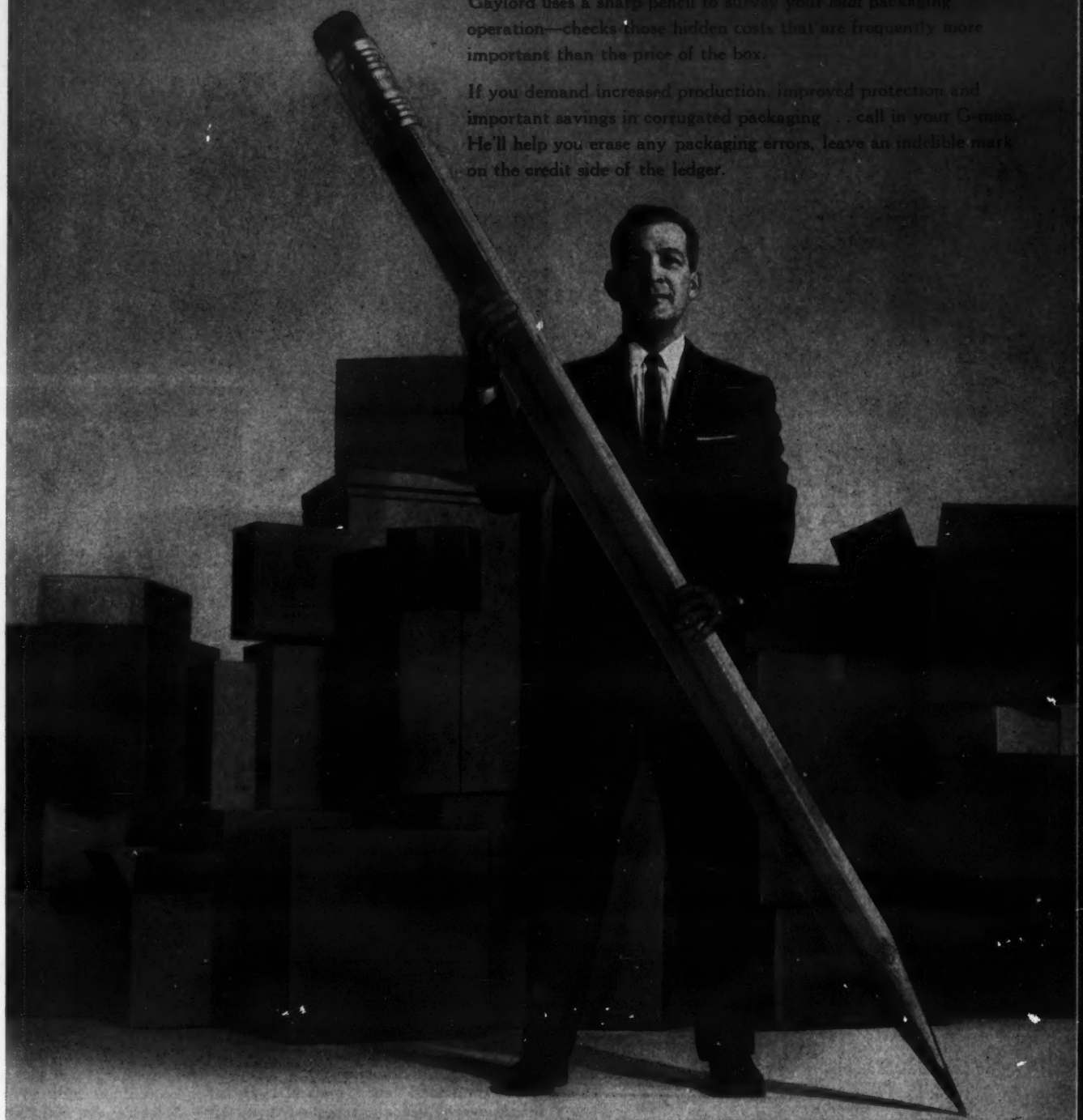
others in your company would also like to receive CHEMICAL PROCESSING personally each month. Include their names on the form opposite the back cover.
Your application for subscription is welcomed.

For more information on product at right, specify 2418 see information request blank opposite last page.

GAYLORD POINTS OUT
MANY WAYS YOU CAN SAVE IN PACKAGING

Gaylord uses a sharp pencil to survey your *total* packaging operation—checks those hidden costs that are frequently more important than the price of the box.

If you demand increased production, improved protection and important savings in corrugated packaging . . . call in your G-man. He'll help you erase any packaging errors, leave an indelible mark on the credit side of the ledger.



GAYLORD
CONTAINER CORPORATION

Gaylord Boxes

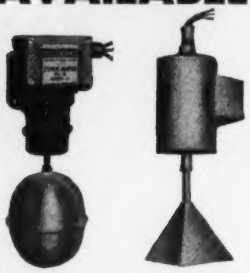
HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

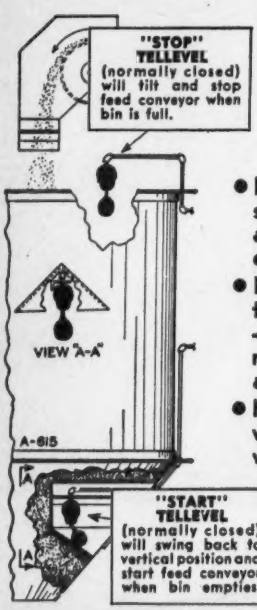
DIVISION OF Crown Zellerbach Corporation

Positive bin level control—
no overflows...no empties
with
STEPHEN S-ADAMSON
"TELLEVEL"
BIN-LEVEL CONTROLS

- Pendant float-ball or float-cone, operates sensitive switch to regulate level of bulk materials.
- As material level rises or falls, "Tellevel" will start or stop feed-conveyors or elevators.
- Will operate light or horn signal.
- Completely automatic system of material control can be arranged by installing "Tellevel" at various levels within bin.

3 MODELS AVAILABLE





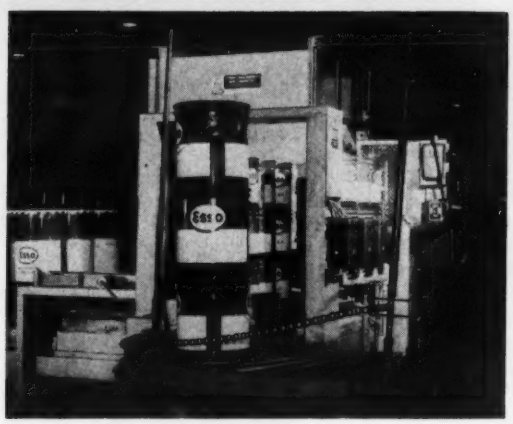
- Normal-Duty "Tellevel" consists of a sturdy dust-tight aluminum casing which houses enclosed switch.
- Explosion-Proof "Tellevel" features an explosion-proof switch — for use with hazardous materials and in explosive atmospheres.
- Heavy-Duty "Tellevel" for severe operating conditions — withstands heavy lumps.

WRITE FOR BULLETIN 11-0

STANDARD PRODUCTS DIVISION
STEPHEN S-ADAMSON MFG. CO.
11 Ridgeway Ave. Aurora, Illinois

Check 2419 opposite last page

Drum-loaded pallet is conveyed to fork-lift pick-up station by loading unit that automatically palletizes 400-lb drums, 120-lb drums, and 35-lb pails



Three-high stacks of 35-lb pails move into loader unit where they are loaded at rate of 10.8 stacks per minute

Esso Standard Oil Company saves time, space, manpower, and eliminates damage on grease drum line with barrel loader that . . .

Automatically palletizes drums and pails

JOHN C. STEEVENS, Assistant Editor

Problem: Package handling procedures on a grease drum line at the Pittsburgh plant of Esso Standard Oil Company were outmoded and wasteful. Heavy drums were placed on pallets manually by using hook trucks which lifted only one drum at a time. Smaller drums and pails were rolled up a small ramp onto a wooden pallet by hand.

Besides being time consuming, this manual operation required considerable floor space because pallets had to be spread out side-by-side.

Solution: An automatic pallet loader was installed on the grease line. The unit loads 400-lb drums, 120-lb drums, and 35-lb pails onto pallets. Hydraulically operated and electrically controlled, the palletizer changes its pattern from one container size to another through an electric eye actuated by the difference in container height.

In operation, all containers are fed into the loader on a conveyor. The pallet dispenser slides a pallet into position. Heavy drums are loaded two at a time, 120-lb drums three at a time, or the 35-lb pails three high, four in a row. The only

manual operation required is stacking of the pails three high prior to feeding into loader. After the containers are moved onto the pallet, the loaded pallet is conveyed to a point where a fork-lift truck can remove it.

Packages of the same style and same product must be fed from filling point to the machine in pallet multiples to facilitate proper palletizing of stacks for warehousing and direct shipment.

Pallet size is conventional 48 x 48" with maximum load of 2000 lb. At capacity for heavy drums (4 drums per pallet), the unit loads 6.2 drums per minute, 10.8 120-lb drums per minute (9 drums per pallet), and 10.8 stacks of 35-lb pails per minute (16 stacks or 48 pails per pallet).

Results: By doing the work of several men, automatic pallet loader saves time and manpower. Since the four-foot-square pallets are stacked 12 high, only 16 square feet of floor space is occupied instead of the 192 square feet formerly taken up by spread-out pallets.

Also, by eliminating manual handling of heavy drums, hazards of smashed fingers and toes are avoided.

Besides these advantages, the loader lowers production costs, provides versatility in handling operations, and assures handling of materials without damage.

(Automatic barrel loader is product of Materials Handling Section, Food Machinery and Chemical Corporation, Riverside, Calif.)

Check 2420 opposite last page.

Nomograph that simplifies right-angle calculations required in specifying fork-lift trucks is offered by manufacturer. Easy-to-use chart, accompanied by straight-edge rule solves fundamental material handling problems, and makes engineer's slide rule unnecessary in computing relationships between dimensions of right-angle aisles and relevant lift truck characteristics. Nomograph is included in all applicable specification bulletins issued by Automatic Transportation Co., Div. of The Yale & Towne Mfg. Co., 149 West 87th St., Chicago 20, Ill.

Check 2421 opposite last page.

STEEL PAILS AND DRUMS . . . AT YOUR FINGERTIPS WITH VULCAN'S FAST DELIVERY! Now you can save time and money on *all* steel container orders because Vulcan's service is almost like having a steel pail and drum supply right in your office! Vulcan stocks all popular sizes and gauges of steel pails and drums and through constant inventory control knows precisely the quantity and description of the stock on hand. Thus, when an order comes in—large or small—it is accurately and speedily processed, filled, and assigned a delivery date. This speed and efficiency is evident in the way Vulcan serves all its customers.

MAKE VULCAN YOUR PRIME SOURCE FOR . . .

STEEL DRUMS 15, 30, and 55 gallon and larger capacities in Open and Tight Head styles. 120-110-100 lb. grease drums. Agitator Drums.

STEEL PAILS Open and Tight Head 1 through 12 gallon capacities.

THE VULCAN "PACKETTE." New palletized pail shipping method saves time and money.

"UNI-DRUMS" with interlocking hoops. The greatest advance in drum design in decades!

HI-BAKE LININGS. Vulcan has a HI-BAKE lining for your product or will work with you in developing one!

FITTINGS AND ACCESSORIES. A wide variety of closures and spouts are available on pails and drums.

WRITE FOR MORE INFORMATION . . .

VULCAN®

CONTAINERS Inc.

Bellwood, Illinois (Chicago Suburb)
Chicago Phone: MAnsfield 6-7660
From Other Cities Phone: Linden 4-5000
In Canada: Toronto 15, Ontario & New Westminster (Vancouver) B.C.

VULCAN CONTAINERS Inc.

Bellwood, Illinois Dept. CP 118

Gentlemen: I am interested in:

☐ Pails ☐ "Packette"
☐ Drums ☐ "Uni-Drums"

Name_____

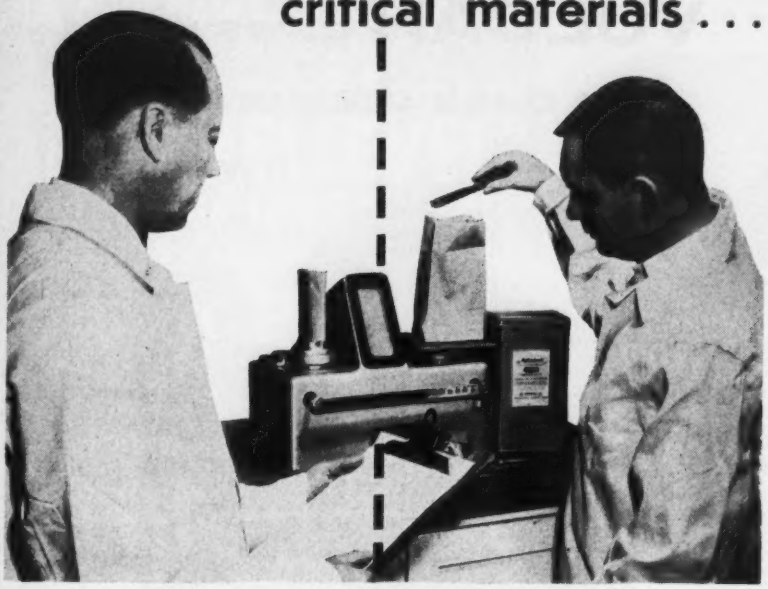
Company_____

Address_____

City_____ Zone___ State_____

Check 2422 opposite last page

For weighing critical materials . . .



Accurate readings are easier, faster with SHADOGRAPH®

Critical materials are measured in precise amounts — with accuracy you can read at a glance — on the Shadograph above. Ultra-visible readings are made possible by shadow-edge indication on an illuminated dial. Parallax is impossible . . . friction is eliminated from indication system . . . balance comes to rest more quickly. Model 4202-B, in use above, has capacity of 500 grams and visible sensitivity of 175 milligrams.

Shadographs are made by The Exact Weight Scale Company and backed by more than 40 years of experience in industrial weighing equipment. Write for Form No. 3333.

SHADOGRAPH MODELS

For compounding, checkweighing, centrifuge balancing and general laboratory use. Capacities from 2,000 milligrams with 1 milligram visible sensitivity to 100 lbs. with ¼ ounce visible sensitivity. Avoirdupois or metric dial and beam. Shadographs are available with photocell controls for operating visual and audible signals, or for controlling auxiliary machines or equipment.

MODEL 4204

Exact Weight SCALES

THE EXACT WEIGHT SCALE CO.

905 W. FIFTH AVE., COLUMBUS 8, OHIO

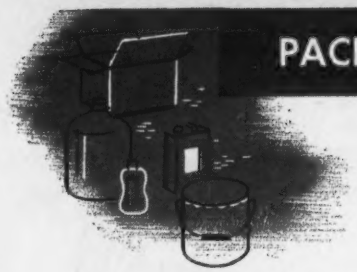
In Canada P.O. Box 179, Station S, Toronto 18, Ont.

Sales and Service Coast to Coast

Find us in your local 'Yellow Pages'

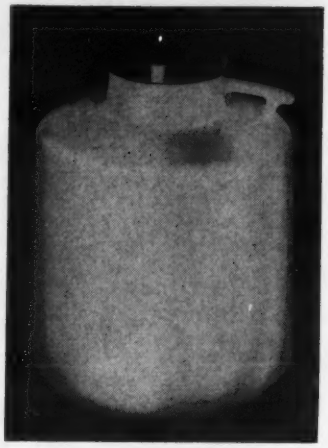
BETTER QUALITY CONTROL . . . BETTER COST CONTROL

Check 2423 opposite last page



PACKAGE IDEAS

Latest developments in packages and their design



Safe handling feature . .

. . . is provided by carrying handle of this two-gal polyethylene bottle. Bottle may be used for various chemicals, liquids, and powders. Weighing two pounds, wide mouthed bottled is fitted with 1000 mm. closure. Actual mouth opening is 3¼". Polyethylene bottle is product of The Nalge Co., Inc., 625 S. Goodman St., Rochester 20, N. Y.

Check 2424 opposite last page.

Self-venting spout . . .

. . . permits pouring and venting simultaneously because of two openings on spout, one for air and one for pouring. Feature permits even flow from full to empty without gulp, gurgles, stoppage. Also, because of its construction, empty container can be filled with ease.

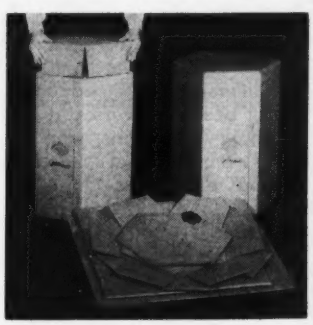
Spout assembly is said to provide leakproof and tamperproof service. According to manufacturers, all filler has to do is to drop assembly into place over filling opening in pail, where it is easily installed with special tool. Tri-Sure self-venting "Clinch-On" Pull-Up spout assembly is product of American Flange & Mfg. Co., Inc., 30 Rockefeller Plaza, New York 20, N.Y.

Check 2425 opposite last page.

For powered chemicals . . .

. . . this product is said to have the properties of a can, with the flexibility of a bag. A suitable container for products having an extreme fineness, it is resistant to sifting and moisture, and is claimed to have great strength. Container packs and travels easily, and exterior surface is suitable for printing sales message. "Canvelope" is manufactured by Kehr Products Co., 401 N. Broad St., Philadelphia, Pa.

Check 2426 opposite last page.



Up to 35% savings . . .

. . . on drum costs are claimed through use of corrugated container that is delivered to user knocked-down-flat. This feature provides economy in storage space during the time that containers are warehoused, before filling. According to manufacturer, freight charges are lower due to lower tare weight, and more of these corrugated containers can be nested in a car.

Container can be manufactured in variety of sizes ranging from 2½-gal to 62-gal

capacity. Since caps lock into position permanently, tear tape is applied on body to facilitate opening which also provides a reclosable feature. Octagonal, hexagonal, or square shapes are available for wide range of items including free-flowing dry chemicals, fan blades, rubber hose, soap powders, and so forth. "Drumpaket" is manufactured by Gaylord Container Corp., Div. of Crown Zellerbach Corp., 111 N. Fourth St., St. Louis 2, Missouri.

Check 2427 opposite last page.

Label glue workable at wide temp range

Cleaning, refilling of gum pot can be eliminated

Uses: Glue for can-labeling machines.

Features: Material will work on both hot (160°F) and cold (40°F) cans and bottles. Performance on wide range of can temperatures eliminates need to clean and refill gum pot when can temperatures are changed.

Description: Hot-melt spot label glue is said to also work well as regular hot pick-up gum. It will machine at more than 500 cans per minute on any standard labeling unit, and apply a permanent bond.

Material is a resin adhesive containing chemical additives, with a melting point of 225°F, and a fast bonding or setting time. Glue is available in five-gal pails.

(M-P No. 144 spot label glue is product of Morningstar-Paisley, Inc., 1770 Canalport Ave., Chicago 16, Ill.)

Check 2428 opposite last page.

How to improve packaging and shipping methods is discussed in handy pocket-size 48-page booklet chock full of new methods of packaging and unitizing products in all industries, as well as recommended methods for shipping these products by rail, truck, or intra-plant handling. Complete line of manufacturer's products is included in Cat 18 — Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

Check 2429 opposite last page.

REDLER*

CONVEYORS-ELEVATORS

For safest, gentlest handling of your bulk materials... en masse!

Horizontal, double run REDLER Conveyor-Elevator handles 15 cubic feet per minute of resinous chips for a southern paper company.

Two inclined 17" REDLER Conveyors carry wood chips to six storage silos. Complete weather protection is afforded by steel casings.

DRAWING OF L-TYPE REDLER CONVEYOR-ELEVATOR

*The REDLER Conveyor is an exclusive STEPHENS-ADAMSON product.

STEPHENS-ADAMSON

THE BIG NAME IN BULK MATERIAL HANDLING EQUIPMENT

The REDLER Conveyor-Elevator is one of the most remarkable bulk materials handling machines ever built. It will move practically any pulverized, granular, small lump, or flaky material around corners, over vertical, inclined, or horizontal planes. Material moves forward in a compact column within a totally enclosed, dust-tight casing which virtually eliminates explosion hazards. Material is moved by means of closely spaced skeleton type flights linked together and moving through the casings. Material flows forward in a compact column. A very useful feature of the REDLER Conveyor is its ability to discharge material at multiple points. Arranged as a horizontal closed-circuit unit, the REDLER Conveyor will re-circulate materials and is often used in packaging or distributing operations.

Compact REDLER Conveyor-Elevator designs are available in sizes to handle almost any tonnage. They are quickly and economically installed and their rigid box-girder-like casings are practically self-supporting. For complete data on REDLER Conveyors and Elevators, write for catalog 358.

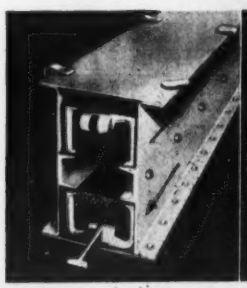
S-A district or main plant offices can supply complete information on any conveyor product, or any phase of bulk material handling. Request a copy of REDLER catalog 358 for your file.

S-A

MFG. CO.

MAIN OFFICE AND PLANT
11 RIDGEWAY AVENUE
AURORA • ILLINOIS

PLANTS LOCATED IN: LOS ANGELES, CALIF. CLARKSDALE, MISS. • BELLEVILLE, ONTARIO



Cross section thru the REDLER Conveyor casing shows material being conveyed in a lower run and the empty flights returning in upper run to complete the circuit. The casing is completely dust-tight, is largely self-supporting and requires very little space.

Exclusive, skeleton type flights linked together to move materials forward in a steady, non-agitated flow. REDLER flights readily curve around corners permitting horizontal and vertical movement of materials with one unit and one drive.

A 180° bend section of REDLER horizontal, closed-circuit conveyor. Sprocket drives side-pull style chain and flights around the bend. Ley bushed type driving chain is supported in a separate trough — no metal to metal contact in conveying chamber

Check 2430 opposite last page

No Other FEEDER Like It!

electro-permanent magnetic

ERIEZ

HI-VI VIBRATORY FEEDER

All-new award-winning feeder built on new concepts of design and materials. Provides accurate, controlled feed of bulk materials *automatically*. Variable feed rate, from ounces to tons. For spreading, sorting, aerating, cooling, proportioning, etc. Feeds all types of bulk materials. Increases production; reduces operating and maintenance cost.

NEW A.C. ELECTRO-PERMANENT MAGNETIC DRIVE PROVIDES GREATER FEEDING CAPACITY • NO RECTIFIER NEEDED • FULLY ENCLOSED POWER ELEMENT PROTECTED AGAINST DUST AND MOISTURE • RUGGED GLASS FIBER SPRINGS REDUCE BREAKAGE • FULLY PROVED IN PLANTS EVERYWHERE.

ALSO AVAILABLE: Economical, specially constructed units for hazardous, dusty locations . . . fully acceptable by Mill Mutual.

WRITE FOR BIG VIBRATORY FACT FILE
Eriez Mfg. Co., 73LC Magnet Dr., Erie, Pa.

ERIEZ

Check 2431 opposite last page

Live storage rack has effortless pallet return

Empty pallets return to rear; no lifting by order picker

Pallet return system which permits use of very narrow picking aisles, since the empty pallet does not have to be pulled out into the aisle, has been added to company's live storage rack system. In an operation that takes only a fraction of a minute and requires very little effort, empty pallets can now be returned to rear of rack without lifting by order picker.

Effortless pallet return system is operated by single lever, takes only fraction of a minute

Operation of a single lever at front of rack locks both pallets in place and simultaneously releases two husky rail pins to permit section of rail carrying empty pallet to swing down and deposit empty pallet on lower return rails. As empty pallet rolls toward rear, upper rails swing back into place. Lowering of lever locks them into place and releases loaded pallets which roll to front of rack at a controlled speed.

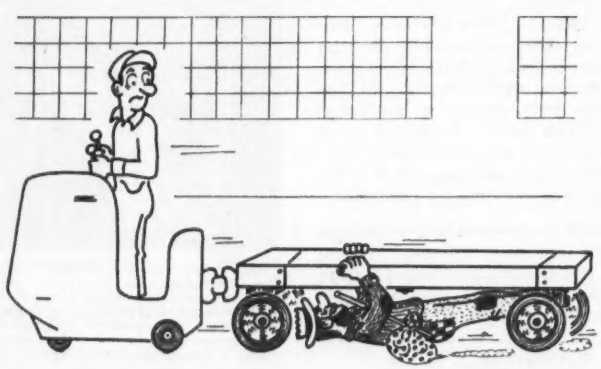
When empty pallet reaches rear of rack it stops. Forktruck operator replaces pallet loads on rack, picks up empties at his convenience for return to packaging department.

Narrow picking aisles permit picking from racks from both sides of aisle with minimum handling effort on part of picker. Since disposal of empty pallet is almost immediate and all empty pallet traffic is in rear aisle, order picking efficiency is at a maximum.

Racks will handle pallets up to four feet wide with loads up to 4000 pounds. Loaded pallets, placed on rack at rear, roll at a controlled speed of about 20 feet per minute to front of rack. Order picking is done from front. Next loaded pallet immediately moves up to front so that picker always has loaded pallet to pick from. Number of pallets in reserve depends on depth of rack. An number of pallet racks can be combined into a bank to provide a complete variety of products within short walking distance of order picker.

(Palletflo rack is product of M-H Standard Corp., 515 Communipaw Ave., Jersey City 4, N.J.)

Check 2432 opposite last page.



jim nance

UNSTICK *stuck* BINS

with new electro-permanent magnetic

ERIEZ

HI-VI BIN VIBRATORS

PAT. PEND.

Here's the newest and most efficient answer to those hard-to-move materials in sticky bins . . . designed to provide superior operating efficiency . . . exclusive pinpointed vibration gets right to the trouble spot — starts stubborn materials moving!

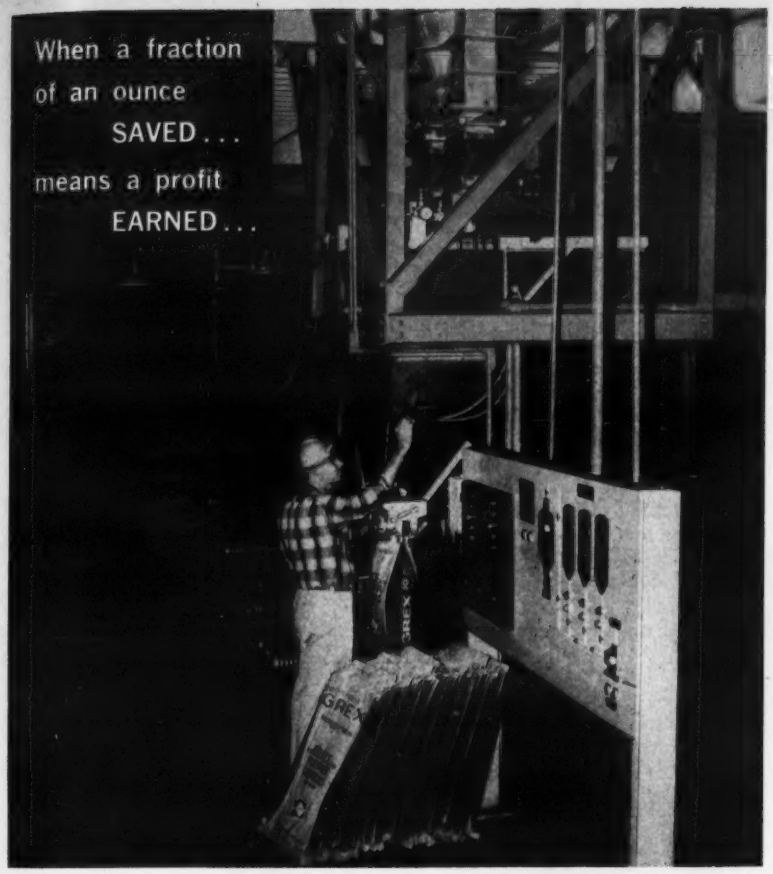
NO RECTIFIER NEEDED • COMPLETELY ENCLOSED HOUSING • GREATER VIBRATION IMPACT THAN COMPARABLE SIZE UNITS • RUGGED AND DURABLE • LOW FIRST COST • LOW OPERATING AND MAINTENANCE COST

Special Mill Mutual ACCEPTED Units for HAZARDOUS DUSTY LOCATIONS

GET BIG CATALOG . . . WRITE TODAY
Eriez Mfg. Co., 73-LB Magnet Dr., Erie, Pa.

ERIEZ

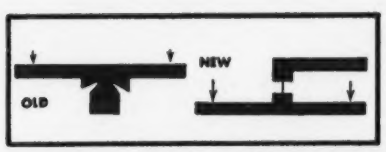
Check 2433 opposite last page



Thayer Scales save valuable material while giving your customers full value

There is no need to overfill *any* packages to insure full weight of *all*. Thayer Scales will accurately weigh valuable materials as fast as an operator can hang bags. Thayer Scales are now in use at the multi-million dollar high-density polyethylene plant of W. R. Grace & Co. at Baton Rouge. This installation followed an original installation of Thayer Scales at Grace's modern nitrogen plant at Memphis.

With Thayer Scales continued tolerances of ±2 ozs. are obtained. A patented bulk-vibratory system of feeders, air cylinder actuated hopper doors and fully automatic controls permit even the most difficult-to-handle* materials to be weighed with *continued* accuracy.



THE THAYER PLATE LEVERAGE SYSTEM IS GUARANTEED accurate for the life of the scale. This simple, patented system eliminates vulnerable knife-edge pivots by utilizing unchanging flexure plates. It is not effected by dirt, vibration or shocks. Its reliability is largely responsible for the highly successful operation of Thayer Filling, Batching and Check-weighing Scales.

**Thayer Scales will also handle flooding or sticky materials with equal accuracy.*

THE Thayer SCALE

***THE THAYER SYSTEM OF PROCESS CONTROL BY WEIGHT**

AUTOWEIGHTION

THAYER SCALE CORP., 6 Thayer Park, Pembroke, Mass.

Check 2434 opposite last page

SHIPPERS OF CHEMICALS

know Continental puts extra service into every steel container

Extra service from Continental smooths the path of many shippers of chemicals. Besides highest quality containers, Continental gives these shippers the benefits of famous Continental service . . . faster delivery, engineering and research assistance in solving their packaging problems, and the special protection of Perma-Lined containers for hard-to-hold chemical products. Solve *your* chemical shipping problems with Continental's steel container service. Call today.

CONTINENTAL CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17 | Central Division: 135 So. La Salle St., Chicago 3 | Pacific Division: Russ Building, San Francisco 4

Check 2435 opposite last page

A modern truck for modern plants

The HydroLectric

with most modern features

- 2 Drive Wheels instead of one
- 2 Braking Systems available instead of one
- 4 Wheel Stability instead of three
- Alloy Gear Transmission instead of chains
- 100% more Steering Ease —Greater Maneuverability
- 50% less Maintenance —Easy Accessibility
- Finger-Tip Control —Greater Safety

Put these modern features to work for you, greater profit at no additional cost.

Write for Bulletin KP

STUEBING Designed • Engineered • Built

LIFT TRUCKS, INC. / 2427 Spring Grove Avenue CINCINNATI 14, OHIO

THERE IS A TRUCK FOR EVERY PURPOSE TO HANDLE ANY KIND OF MATERIAL.

Check 2436 opposite last page

CESCO JR. DUMPERS

LIFTS and DUMPS

BAGS • BOXES
DRUMS • BULK
REMOVABLE BOX TRUCKS
Loads Bins, Batchers and Mixers

CESCO Jr. is a fast, lightweight machine that can handle seventy-five 400 pound loads per hour. It can be equipped as a multi-purpose machine with changeable skips for handling drums, bags, etc. or is available with any one skip for single purpose operation. Standard portable models dump at heights from 2 to 8 feet and stationary models dump at heights from 2 to 16 feet. Special models available for any height required. Cesco Jr. is powered by a ½ h. p. motor (3 phase or single phase) and features standard push button controls. For more details write for our free catalog.

ESSEX CONVEYORS, INC.
165 Franklin Avenue, Nutley 10, N.J., Dept. C
COLSON EQUIPMENT & SUPPLY CO.
1317 Willow Street, Los Angeles 13, California

CESCO DUMPERS

Check 2437 opposite last page

Rugged construction of Y-type flow diverter cuts maintenance

Uses: For air conveying lines.

Features: All metal construction of unit, and only one moving part, minimize maintenance problems.

Description: Y-type flow diverter for air conveying line operates with compressed air, either automatically or by manual control. It is available for standard 1½, 2, 3 and 4" air conveying lines.

Switching of lines is instantaneous and it is accomplished "on stream" by piston actuated by compressed air. Closely machined tolerances and force of air prevent any clogging or jamming of piston by material being conveyed. Rubber sleeves or other rapidly wearing parts are not used.

Constructed of heavy cast metal, Y-type flow diverter can be used in conjunction with most air conveying systems with same size lines

(Y-type flow diverter is product of Superior Separator Co., 121 Washington Ave. South, Hopkins, Minn.)

Check 2438 opposite last page.

Ball-bearing trolleys and their operation in maintaining efficiency of trolley conveyors are described in detail in 20-page bulletin. Application and maintenance information, along with data on trolley wheels, rollers, and special types of trolleys, are included in Book 2636 — Dept. PR, Link-Belt Company, Prudential Plaza, Chicago 1, Ill.

Check 2439 opposite last page.

The NEW Dings

"CORONATRON"

ELECTROSTATIC SEPARATOR

. . . proved in use for high efficiency, low cost DRY SEPARATIONS

From plastics to pharmaceuticals, salts to sulphur, and a wide variety of other chemicals—you can treat dry granular products with low-cost efficiency to remove impurities and up-grade your products.

Electrostatic separation with the new Dings CORONATRON is the secret! Multiple separation zones in vertical arrangement deliver high capacities at 99% purity with no further treatment.

The CORONATRON, with economical low intensity design or with the exclusive patented sparkless electrode for safe high intensity operations, has been thoroughly job proved in the chemical processing industries. Its many profit-making features are well worth your investigation. Write today for literature.

Dings ES-358½

DINGS MAGNETIC SEPARATOR CO.
4731 W. Electric Ave., Milwaukee 46, Wis.

Check 2440 opposite last page

THAT'S INTERESTING

Big charge, hard metal

University of Chicago's Los Alamos Lab Team is researching explosive hardening of metals. Shock waves (almost 9 million psi) from shaped charges harden metal more than cold rolling. Explosions change metal's structure but not dimensions. (*Industrial Research Newsletter,* Armour Research Foundation)

Atomic energy home use

Nearly 3,500,000 kilowatt hours of electricity generated by nuclear power program in a recent month were used by homes and industry in Southern Californa. Source of power is Sodium Reactor Experiment (SRE), test reactor Atomics International division of North American Aviation, Inc., has been operating at its full power level of 20,000 kilowatts of heat since July 18.

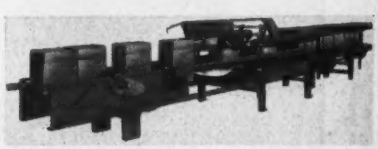
For more information on product at right, specify 2441 see information request blank opposite last page.

Simoniz puts "protection" in a can

Packomatic® puts the cans in a case

Packomatic equipment feeds, forms, positions, loads, seals and imprints corrugated shipping containers automatically. However you ship—in multi-ply paper bags, or in corrugated shipping containers; whatever you "package"—a can, a carton, a box or a bale—there's a Packomatic machine designed to handle your shipping container requirements. Packomatic machines, geared to your production line, will feed, form, position, load, seal and imprint corrugated containers automatically—or do any of these operations singly as a complement to your existing packaging facilities. Let one of our sales engineers suggest the start of a long-range packaging program for your plant. Investigate the Packomatic method of cutting costs and boosting production. Call, write or wire today.

Fully-automatic Packomatic Case Former-Loader, part of a fully-automated production line at the Simoniz plant, Kankakee, Illinois. Other Packomatics on the Simoniz line include Case Sealers and Case Imprinters.



Begin to automate your packaging line with this high-speed, fully-automatic Case Sealer. Aligns loaded cases, positions flaps, glues, seals and discharges — and no operator needed! Available in wide range of sizes. Semi-automatic, too. Call or write for additional information.

J. L. FERGUSON CO. Joliet 6, Illinois

PACKOMATICS include the Bale Sealer • Case Sealers • Opener-Loaders • Case Imprinters • Telescoping Volumetric Fillers • Packer-Gluers • Semi-automatic or fully-automatic.

Store or ship your products in

Ellisco CANS for CHEMICALS

a wide range of styles, shapes, and sizes offer

POSITIVE PROTECTION

The variety of sizes and types of ELLISCO cans available to package your dry, semi-liquid or liquid products is almost as great as their uses. These popular containers are available in square, rectangular or round types with snug-fitting slip covers, single friction or double friction plugs, or screw caps to seal contents in, dust and moisture out.

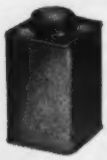
ROUND CANS: ¼" to 17⅛" Diameters. 1½" to 30" Body Heights.
SQUARE CANS: 2¼" x 2¼" to 11½" x 11½" Base Dimensions. 2" to 12" Body Heights.
RECTANGULAR CANS: 2⅛" x 1⅜" to 7¼" x 5⅛" Base Dimensions. 2" to 12" Body Heights.

Many types and sizes are available from stock. Special shapes and sizes can be made to order. Write, wire or call for full details.

GEORGE D. ELLIS & SONS, INC
4018 N. AMERICAN ST., PHILADELPHIA 40, PA.
BAldwin 3-3405

ROUND SLIP COVER CANS
May be tape sealed if air tight closures are required.

LITHOGRAPHED CANS
Cans of all shapes and sizes may be lithographed in your design and color combinations.



ROUND CORNERED, SQUARE AND RECTANGULAR CANS

Check 2442 opposite last page

MAGLINER MOBILE LOADING RAMPS

"Before installing our Magliner Mobile Loading Ramp," reports Mr. Leonard Wood, Plant Manager, Witco Chemical Co., "It took 16 to 18 manhours to unload a railcar from ground-level, and four manhours to unload a truck. Three men were required to handle each job. *Now, one man and power truck handle a truck shipment in fifteen minutes . . . a railcar shipment in four hours.* We figure our Magliner Loading Ramp paid for itself in six months, besides giving us extra safety for men, loads and equipment, and reducing our lift truck maintenance."

ASK ABOUT THE MAGLINER PROOF POSITIVE PLAN—See a Magliner mobile loading ramp at work, cutting costs right in your own operation.

Now Available! NEW NON-SLIP GRATING SURFACES FOR SAFE, SURE TRACTION IN ANY WEATHER
Another Magliner Exclusive!

MagLiner MAGNESIUM MOBILE LOADING RAMP

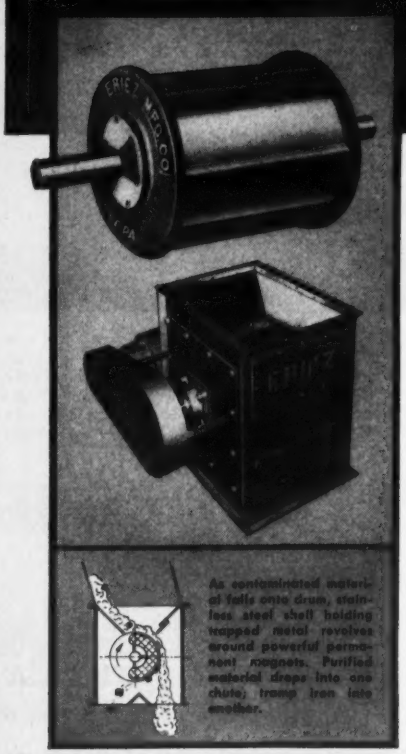
Write for Bulletin DB-211, Magline Inc., P.O. Box 4311, Pinconning, Mich.

Check 2443 opposite last page

Get increased protection . . . new ERIEZ

MAGNETIC DRUMS

now up to 50% stronger than old-style drums!



Costly maintenance problems eliminated with new replaceable Shell and Bearings! Expanded, improved line of permanent magnetic drums invaluable for automatic continuous removal of ferrous contamination from foods, chemicals, grains, plastics, ceramics, rubber, etc.

Stronger, larger, more efficient magnetic elements provide more magnetic power, better protection than ever before possible! New magnetic units trap and remove small and medium iron fines as well as heavier pieces of tramp metal from processing lines. Protect machinery, prevent fires and explosions, eliminate product contamination. Quickly, easily installed at discharge end of gravity flow chutes, spouts, screw conveyors, etc. For wet or dry materials. With or without housings. Peak protection at low cost.

NEW, TIME AND MONEY SAVING FEATURES! *Easy drum removal;* no need to remove housing. *Bearing replacement simplified;* no disassembly of shell required. *Replaceable shell;* excellent for abrasive applications. Stainless steel shell construction won't pit or corrode. *Dust-tight housing;* all steel, welded construction. *Adjustable magnetic element;* magnetic area can be moved to insure peak efficiency for varying sizes of ferrous contamination. *Lifetime guaranteed permanent magnets;* can't fail or burn out. *Continuous efficiency;* unaffected by external conditions. *Wide range of sizes;* standard diameters of 12", 15", & 18". 24" heavy duty diameter. 10 standard widths.

Eriez, pioneer and world's leading producer of magnetic equipment, builds a complete line of separation, vibration and automation units. Our skilled field and lab staffs are always ready to help solve a problem.

For literature or information, write Eriez Mfg. Co., 73LA Magnet Drive, Erie, Pa.

Magnetic SEPARATION AUTOMATION VIBRATION Equipment

ERIEZ HI-POWR MAGNETIC SEPARATORS

ERIEZ

Check 2444 opposite last page

HANDLING & PACKAGING

Ink-drying problem on difficult stocks eliminated

Uses: As imprinting attachment for continuous-feed wrapper.

Features: Unit is said to eliminate any ink-drying problems on hard-to-print stocks such as wax paper, polyethylene, cellophane, foil, and so forth.

Description: Roll-leaf printing attachment is compact unit that operates like an automatic typewriter. It makes crisp, rub-proof impressions of code-dates or other legends

Imprinting machine makes as many as 1000 rub-proof code-date impressions with only five cents worth of leaf

through a ribbon of inexpensive leaf material. According to manufacturer, 1000 code-date impressions can be obtained with as little as five cents worth of leaf, which is available in various colors.

(Model P-11 "Wrap-A-Printa" is product of Adolph Gottscho Inc., Hillside 5, N.J.)

Check 2445 opposite last page.

How to solve handling problems through use of manufacturer's conveying equipment is detailed in 43-page illustrated handbook. Nearly 200 photographs, explanations, and drawings point up specific uses for conveyors and special-accessory equipment. Front index serves as easy guide to categories in which principal features of handbook are divided. Bul GC-58 — Rapids-Standard Company, Inc., Rapistan Bldg., Grand Rapids, Mich.

Check 2446 opposite last page.

CP Staff Photo

Permitting recovery of 60,000 lb of inert grain from each reactor during turnaround that would otherwise be discarded, specific gravity separator . . .

Saves a million pounds of material per year

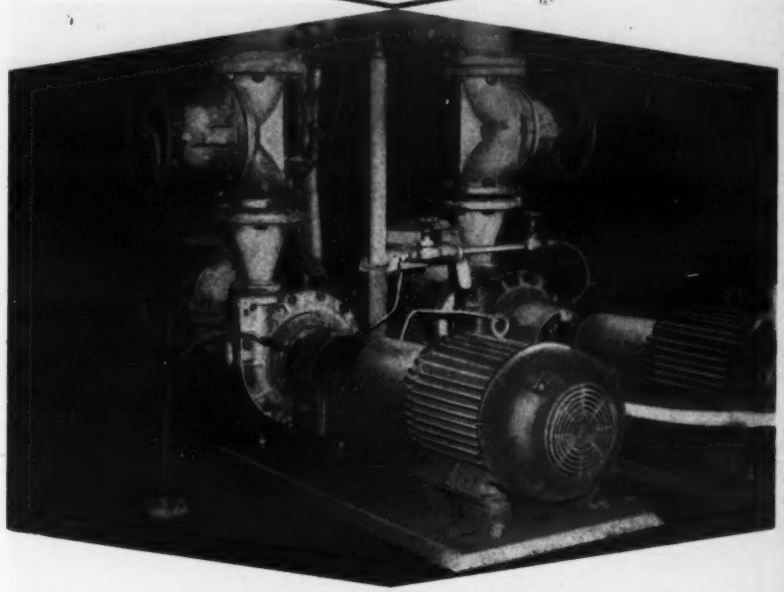
GORDON WEYERMULLER, Petrochemical Editor
with **JAMES CLARK,** Process Engineer
Texas Butadiene & Chemical Corporation

Problem: Conventional screening method used for separating catalyst, such as has been used at some butadiene plants, results in the loss of 60,000 lb of inert alumina grain from each reactor during each turnaround. Where a number of reactors are usually involved and turnarounds occur at intervals of about eight months, this could mean a large loss of material, which costs a considerable amount of money to replace.

Solution: When the Texas Butadiene & Chemical Corp. plant near Houston was being planned, a specific gravity classifier to be used for catalyst separation was included in equipment. This unit consists of a number of screens and air tables which effectively separate various components of catalyst bed.

Catalyst bed consists of four layers of material. Bottom layer contains 3″ of ½″-diameter alumina balls. Next comes 3″ of ¼″ alumina balls. Third layer from bottom consists of 36″ of Houdry chrome-alumina catalyst mixed with inert alumina grain, both averaging about ⅛″ in diameter. This 36″ layer contains 60% catalyst by volume and 40% alumina grain. Top layer, like the bottom, contains 3″ of ½″ alumina balls. Each reactor has 150,000 lb total material in

ONLY DORR-OLIVER MAKES
3 DIFFERENT PUMP TYPES
for chemical processing



Corrosion-resisting
OLIVITE PUMPS
pay off at gaf

The 2″ Olivite pumps shown above at General Aniline & Film Corporation's Linden, N. J., Dyestuff and Chemical Plant were installed after GAF had experienced considerable difficulty in the handling of concentrated muriatic acid and a caustic soda-sodium hypochlorite mixture at room temperature.

Lined with Dupont's Hypalon Elastomer for improved corrosion resistance, these Olivite pumps have given highly satisfactory and relatively maintenance-free service. Their performance is typical of Dorr-Oliver pumps – application engineered for chemical industry requirements.

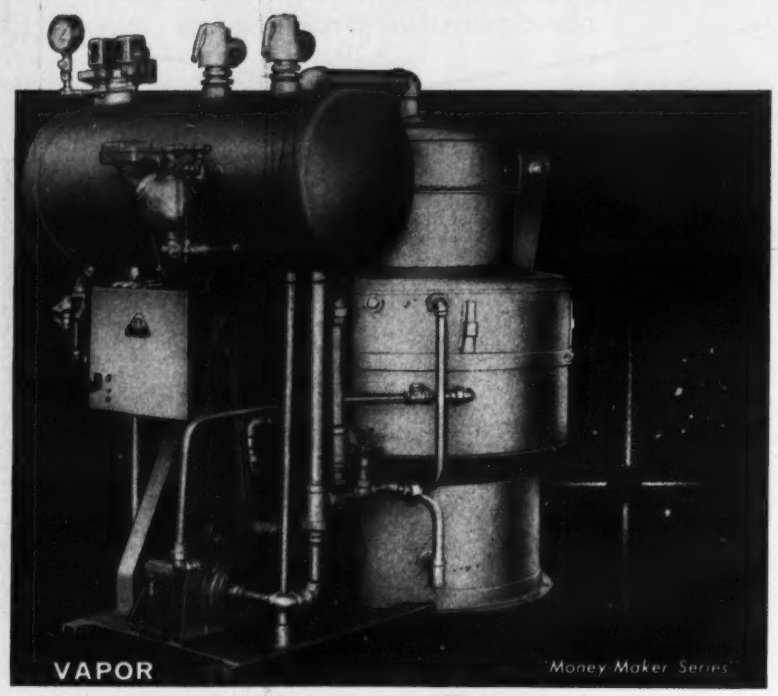
Only Dorr-Oliver can offer three distinctly different pumps designed for complete coverage of chemical processing needs – the Olivite (lined), the O.D.S. (diaphragm) and the Type "L" (alloy centrifugal). For complete information write for catalog to Dorr-Oliver Inc., Stamford, Connecticut.

Hypalon—Reg. T. M. E. I. duPont de Nemours & Co.
Olivite—Reg. T. M. Dorr-Oliver Incorporated

DORR-OLIVER
INCORPORATED
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT
STAMFORD • CONNECTICUT • U S A

Check 2447 opposite last page

SAVES MORE SPACE THAN IT TAKES UP!...



DRUM MODULĀTIC

WATER-TUBE BOILERS

are SO COMPACT . . . SO EFFICIENT . . . they require only one-fourth the floor space of conventional boilers of comparable ratings!

SEE FOR YOURSELF!

All of this space is required for a conventional boiler.

Modulatics do much more than save space. They deliver 4 BHP per square foot of floor area . . . come completely assembled and wired . . . require no special foundation no forced-draft chimney . . . install in a few hours for fully automatic push-button operation. Features quiet 15-second guaranteed low fire "cotton-soft" start!

Output: 20 to 200 hp; 15 psi steam pressure; 670,000 to 6,690,000 btu/hr . . . instant hot water; full pressure in five minutes from cold starts.

Three Ways to Buy!

1. Cash on delivery—1% discount.
2. 1% 10 days, net 30 days to established credit.
3. Extended terms—up to 36 months after down payment.

NEVER NEED REPLACEMENT

Modulatics accessible design permits quick, simple replacement of water-tube coils (or other parts) for lifetime peak efficiency. Entire unit covered by 1-year materials and workmanship warranty and a 5-year coil warranty includes up to $50 labor allowance!

It will pay you to get the facts. Send the coupon now for complete information.

VAPOR HEATING CORPORATION
80 East Jackson Boulevard
Dept. 3-K
Chicago 4, Illinois

☐ Please send Bulletin 475 on Vapor Drum Modulatic
☐ Send Bulletin 486 on extended payment terms.

Name_____
Company_____
Address_____
City, Zone, State_____

Check 2448 opposite last page

four layers of catalyst bed.

Every eight months spent chrome-alumina catalyst must be replaced. The catalyst itself is discarded and replaced with new material. Inert grain and two sizes of balls are reclaimed.

Reclaiming Process

Some clinkers may have formed in reactors due to fusion of catalyst and grain. These are removed with a large mesh screen. Remaining material is transferred to an underground hopper near specific gravity separator.

Bucket elevator takes material to top deck screens of catalyst classifier. Three screens are used here. First the ½" balls are screened out and sent to a hopper. Second screen takes out ¼" balls and sends them to another hopper. Catalyst and grains come out together with third screen. Catalyst dust passes through third screen and out to spent catalyst hopper.

Air Tables

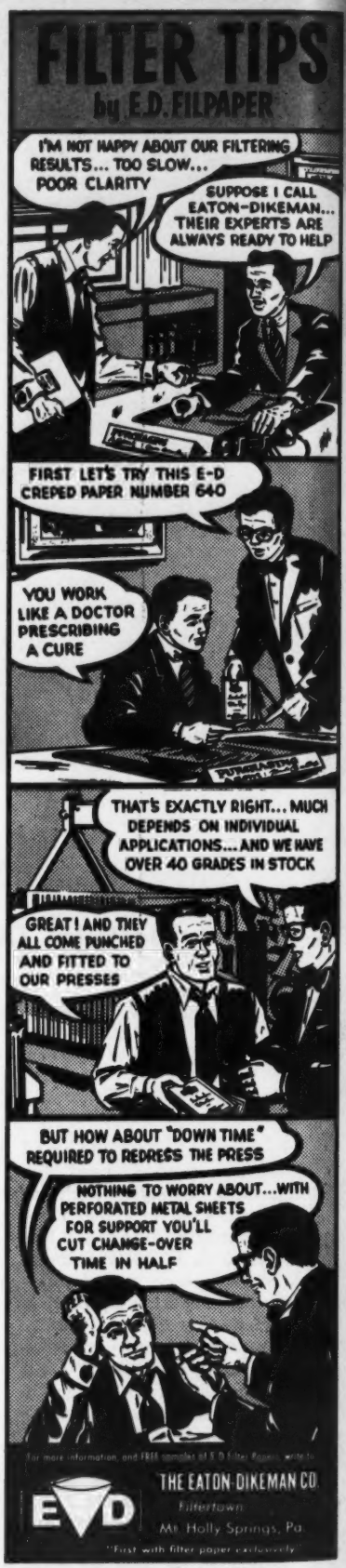
Catalyst and inert grain from third screen are separated on air tables. These are screens that vibrate on an angle, with the lighter catalyst moving upward on the screen to lines leading to spent catalyst hopper. Grain is twice as dense as catalyst, permitting good separation by this method.

Inert grain and the two sizes of balls recovered are repacked in reactors along with new catalyst.

Results: About 100,000 lb of balls and inert grain is recovered from each reactor. About 60,000 lb of this material recovered is inert grain which would have been lost by other recovery method. Since 14 reactors are involved, this means saving 840,000 pounds during each eight-month period or more than a million pounds per year that would otherwise be lost.

(Specific gravity separator is product of Sutton, Steele & Steele, Inc., 1031 S. Haskell St., Dallas, Texas.)

Check 2449 opposite last page.



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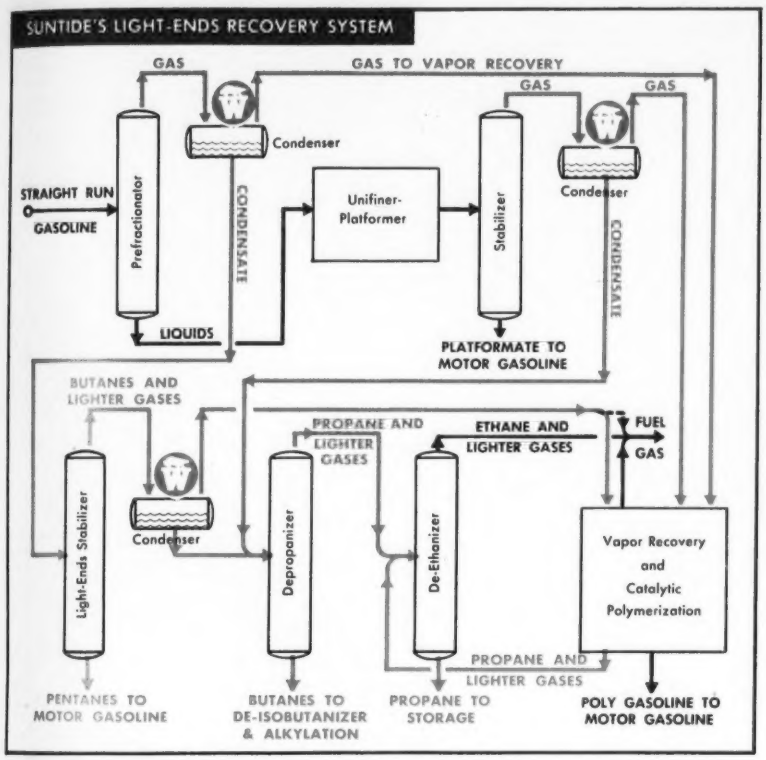
WOLVERINE
TUBE
Items of Interest to the Processing Industry

PUBLISHED BY WOLVERINE TUBE



Payout in less than a year

SUNTIDE BOOSTS LIGHT ENDS RECOVERY

BY ERNEST DODD

Because of its ability to increase the throughput of existing heat exchangers and condensers, Wolverine Trufin® Type S/T—the integrally finned tube—was used to tube many exchangers in Suntide Refining Company's new light-ends-recovery system installed recently at Corpus Christi, Texas. Suntide is an affiliate of Sunray Mid-Continent Oil Co.

To reduce installation costs, Suntide designed its new light-ends-recovery system so that it would take full advantage of existing facilities and equipment. Because of the increased efficiency achieved in recovery of light ends, Suntide expects payout to occur in less than a year.

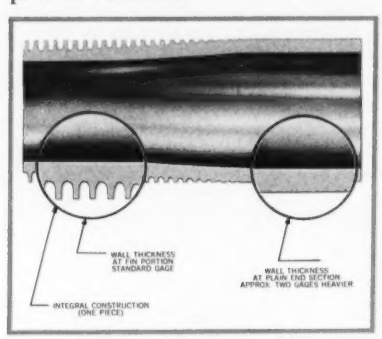
Installations such as this are made to order for Wolverine Trufin Type S/T. Since it is an extended surface tube, with fins extruded directly from the tube wall, Trufin Type S/T has approximately 2½ times more surface area than plain tube. Because of this it is possible to pack more heat transfer surface into a given area—thus stepping up the capacity of existing equipment.

Also of major importance is the fact that Trufin Type S/T is interchangeable in shell and tube heat exchangers and condensers with the prime surface tube it was designed to replace. In fact only standard tools and retubing techniques are required.

Wolverine Trufin Type S/T is available in a wide range of sizes in copper and copper alloys, aluminum and steel. Next time you consider heat exchanger tube specify Wolverine Trufin Type S/T —realize the increased heat transfer performance this integrally finned tube makes possible. Write for complete information.

WOLVERINE TRUFIN® TYPE S/T IS ENGINEERED FOR THE JOB

Wolverine Trufin Type S/T is specifically engineered for use in shell and tube heat exchangers and condensers. The cutaway illustration, below, graphically shows its unique, one-piece construction. Because of this, Trufin Type S/T gives constant performance over a longer period of time. Fins are unaffected by vibration, thermal shock or pressure variations.



EASY TO INSTALL

Here's proof (in the drawings below) that Trufin Type S/T rolls into headers as easily as does plain tube. Standard rolling-in methods only are necessary —there is no deviation from existing fabrication procedures.

Wolverine Trufin Type S/T is the original, integrally finned condenser tube. It was developed and pioneered by Wolverine Tube. Over the years Wolverine Tube has compiled a great deal of heat transfer information—particularly in the field of finned tube applications. If you have a problem — don't hesitate — ask for the assistance of a Wolverine Field Service Engineer. There is no obligation.

Wolverine Trufin Type S/T Condenser Tubing

Prime Surface Condenser Tubing

prefabricated to your specifications and shipped in exact installation order

save space and reduce inventory problems

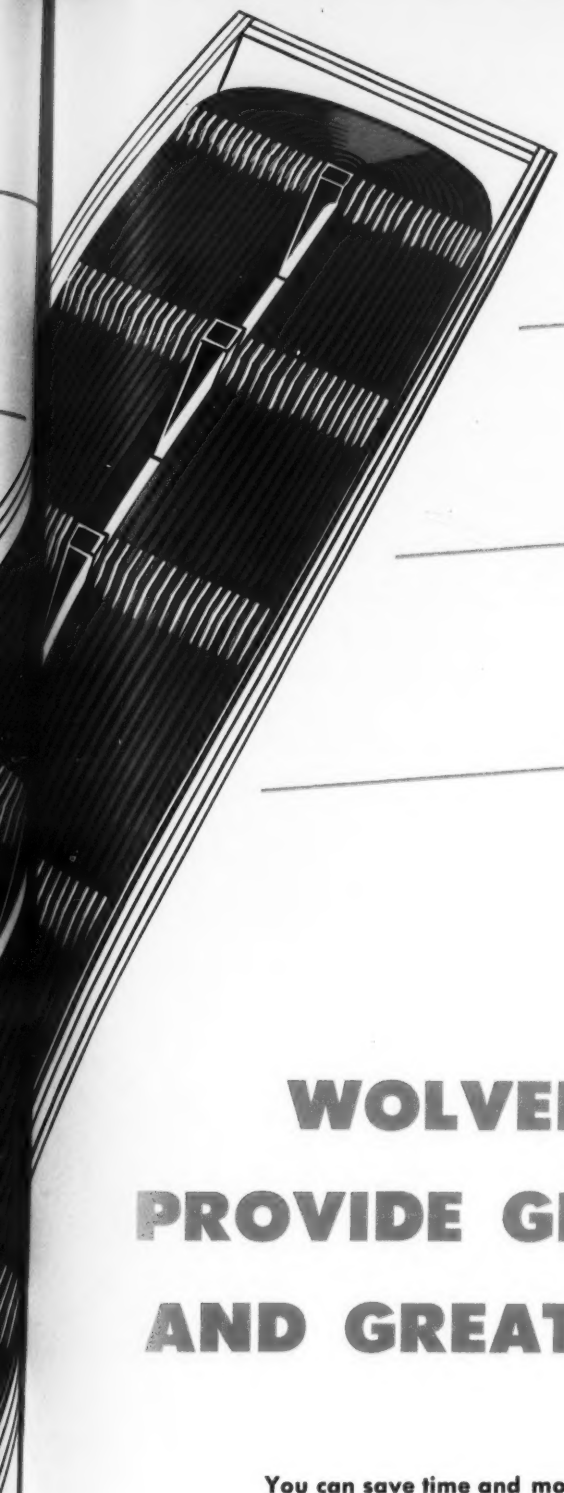
eliminates one tube sheet—

cut rolling-in operations by half

available in prime surface form or with integral fins

provide easier transportation and handling—particularly in tubes over 30 feet in length

make installations easier and faster



shipped in disposable box type pallets

available in copper, copper alloys, aluminum, seamless steel

stock complete installations, use when needed

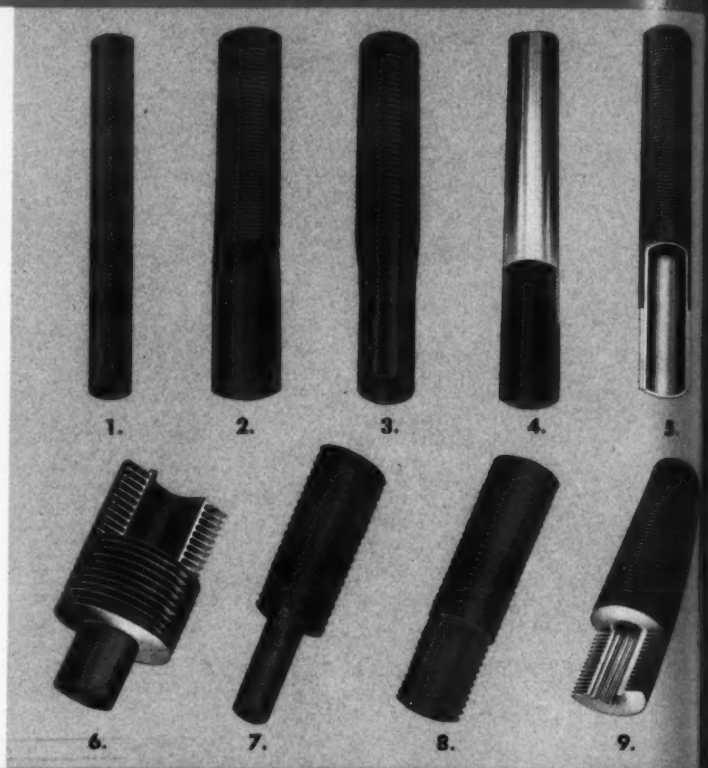
WOLVERINE U-BENDS PROVIDE GREATER ECONOMY AND GREATER CONVENIENCE

You can save time and money by specifying prefabricated Wolverine U-bend condenser tubes in either finned (Wolverine Trufin) or prime surface form. Wolverine bends these tubes to your specifications—ships them to you in the exact order of installation in disposable box-type pallets. Check the advantages listed above and then the next time you retube specify Wolverine U-bend condenser tubes. Write for complete information or talk to your Wolverine Sales Representative.

CONDENSER TUBES FOR EVERY JOB

From its years of experience in the heat transfer field Wolverine Tube has developed a condenser tube lineup designed to meet every need. Engineers can, for example, specify prime surface tube . . . integrally finned (Wolverine Trufin) or duplex tubing . . . all in a wide range of sizes and alloys. Next time you specify heat exchanger tubing remember that Wolverine Tube can meet *ALL* your needs.

1. **PRIME SURFACE TUBE**
2. **WOLVERINE TRUFIN TYPE S/T**
3. **WOLVERINE TRUFIN TYPE W/H**
4. **PRIME SURFACE DUPLEX TUBE**
5. **WOLVERINE TRUFIN—DUPLEX**
6. **WOLVERINE TRUFIN TYPE L/C**
7. **WOLVERINE TRUFIN TYPE H/R**
8. **WOLVERINE TRUFIN TYPE H/A**
9. **WOLVERINE TRUFIN TYPE I/L**



TECHNICAL HELP FOR EVERY JOB

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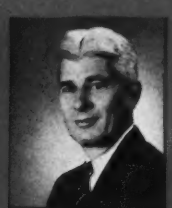
Detroit 28, Mich.
WE 1-0783



J. A. MARSHALL
148 Spear St.
San Francisco 5, Cal.
SU 1-7222

H. J. LOETZOW
Room 4004
60 East 42nd St.
New York 17, N. Y.
MU 2-8430

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Philadelphia 7, Pa.
RI 6-1442

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Corner of Commerce
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B. E. WESSELS
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Nat. Bank Bldg.
Evanston, Ill.
Evanston—DA 8-8[illegible]
Chicago—RO 4-7[illegible]

If you're having trouble with heat transfer problems . . . such things as equipment design or alloy selection you can obtain expert help real fast. Just get in touch with one of Wolverine Tube's Technical Sales Representatives. They're as close as your telephone and because of their specialized training are fully qualified to help you solve the most difficult problems. Call on them next time you need help.

CALUMET & HECLA, INC.
CALUMET DIVISION
URANIUM DIVISION
GOODMAN LUMBER DIVISION
WOLVERINE TUBE DIVISION
In Canada:
CALUMET & HECLA OF CANADA LIMITED
WOLVERINE TUBE DIVISION
CANADA VULCANIZER & EQUIPMENT CO. LTD.
UNIFIN TUBE DIVISION

WOLVERINE TUBE
DIVISION OF
CALUMET & HECLA, INC.
17234 Southfield Road
Allen Park, Michigan
Manufacturers of Quality-Controlled Tubing and Extruded Aluminum Shapes

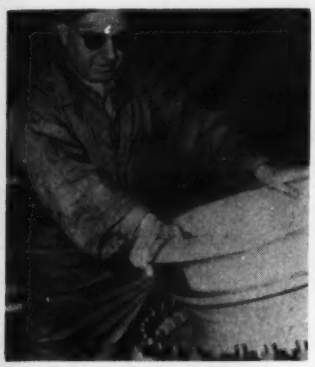
PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA
SALES OFFICES IN PRINCIPAL CITIES
EXPORT DEPT. 13 E. 40TH STREET, NEW YORK 16, NEW YORK

Wolverine Trufin is available in Canada through the Unifin Tube Division, London, Ontario.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

Plastic dump chute cuts wear and tear on reactor manhole

Manhole openings on glassed-steel reactor can now be protected during charging by use of polyethylene dump chute. Available in various sizes, chute is designed to fit inside manhole, protecting both flange and neck of opening.



Polethylene dump chute provides inexpensive insurance against damage to manhole of glassed-steel reactors

Chute is not recommended for use under hazardous conditions where vessel contents or surrounding atmosphere are flammable. Passage of certain materials over surface of polyethylene chute may generate static charge with possiblity of sparking.

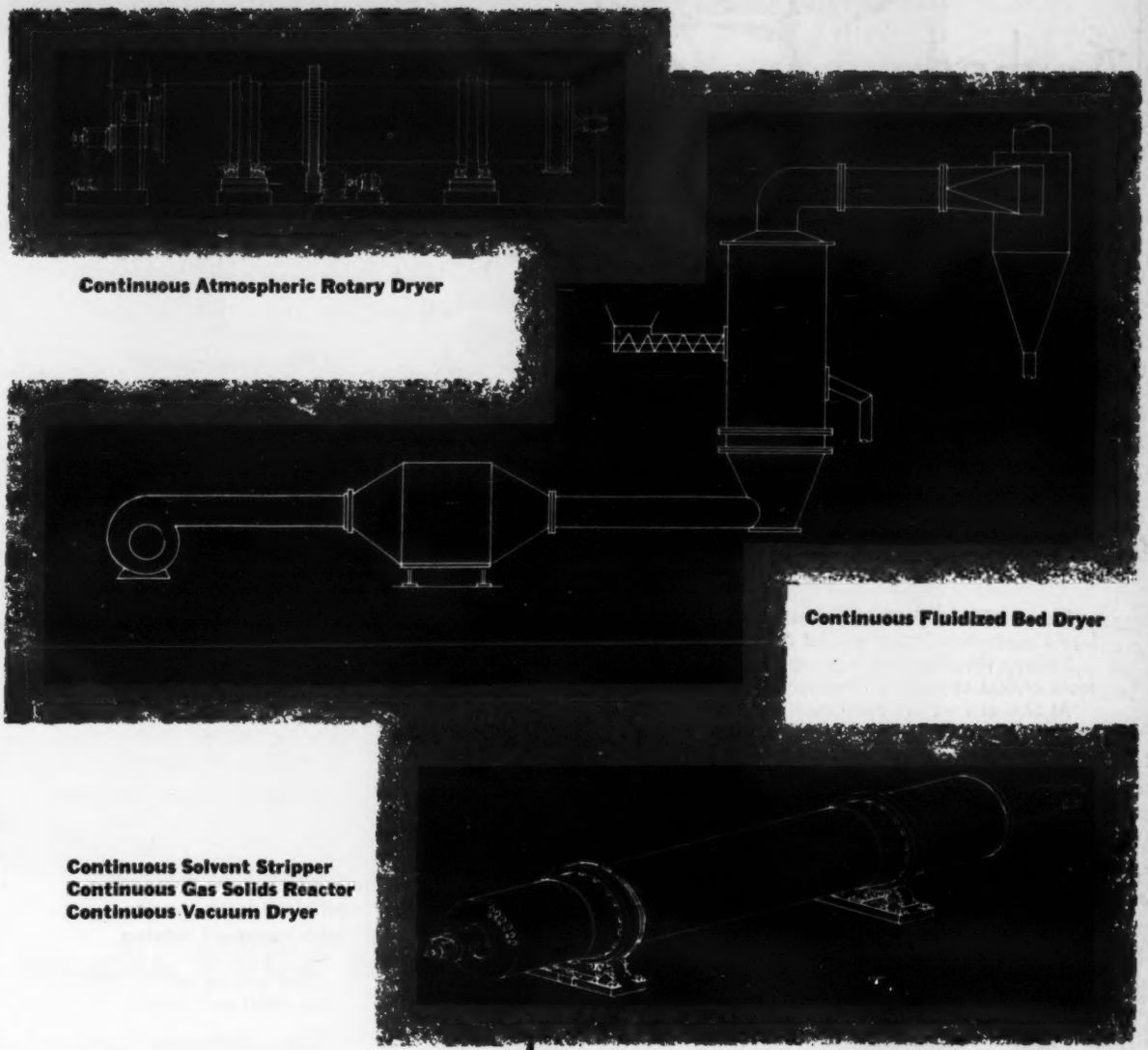
(Polyethylene dump chutes are product of The Pfaudler Co., a division of Pfaudler Permutit Inc., 1066 West Avenue, Rochester 3, New York.)

Check 2451 opposite last page.

Continuous mixing problems in chemical field are discussed in eight-page publication in which features of manufacturer's continuous mixers operating on the List system are detailed. Cat K-57 — Chemical Machinery Div., Baker Perkins Inc., 1000 Hess, Saginaw, Michigan.

Check 2452 opposite last page.

For more information on product at left, specify 2453 . . . see information request blank opposite last page.



Continuous Atmospheric Rotary Dryer

Continuous Fluidized Bed Dryer

Continuous Solvent Stripper
Continuous Gas Solids Reactor
Continuous Vacuum Dryer

Now, at one convenient location, you can test-dry your materials in a variety of equipment

At General American's East Chicago pilot plant, you can test the drying or reacting of your materials in the widest range of drying equipment ever assembled in one place.

Louisville Dryer engineers will work with you—study your materials and needs, make recommendations for type of equipment, size and heating medium. You can check these recommendations for yourself through practical tests. Your Louisville Dryer is then engineered for most efficient and economical service—built specifically to meet your needs.

To test the drying of your materials in all these different types of drying equipment, call in a Louisville Dryer engineer. There is no cost or obligation.

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

LOUISVILLE DRYER DIVISION
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street, Chicago 90, Illinois
Offices in principal cities

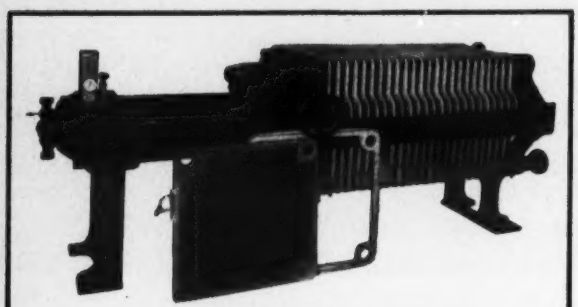
Check 2454 opposite last page

Anybody can build a filter

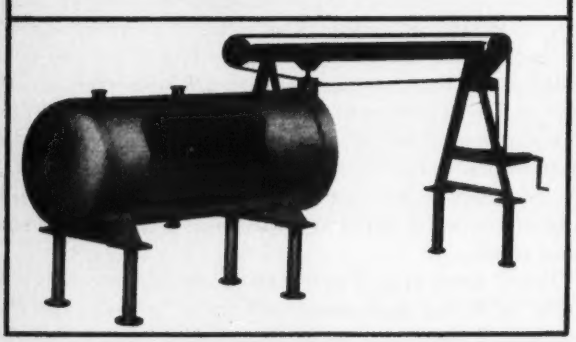
From earliest antiquity man has contrived to solve his problems in solids-liquid separation in a thousand different ways, some quite ingenious.

Today's filtration problems are more challenging than ever, calling for more critical appraisals and precise answers.

At Shriver's we are dedicated to investigating your problems and recommending and building the kind of filter that will *best* meet *your* specific purpose. And we do build many types! May we be of service?



Shriver filter press with plates of molded wood or glass fiber reinforced polyester and frames of polyvinyl chloride coated aluminum; a new combination of strong, lightweight materials of construction for resistance to many acid and alkaline process materials.



Shriver horizontal tank, vertical leaf pressure filter, with many improved features, recommended primarily for products in which liquid and solids are not miscible with water, or for other cases where the solids must be removed as a semi-dry cake.

T. SHRIVER & COMPANY, INC.

846 HAMILTON STREET • HARRISON, N. J.

SALES REPRESENTATIVES IN: Decatur, Ga.—Houston, Tex.—Livonia, Mich.—St. Louis, Mo. San Francisco, Cal.—Montreal, Que.—Toronto, Ont.

FILTER PRESSES • VERTICAL LEAF FILTERS • FILTER MEDIA
HORIZONTAL PLATE FILTERS • CONTINUOUS THICKENERS
SLAB FORMERS • DIAPHRAGM PUMPS • ELECTROLYTIC CELLS

Check 2455 opposite last page

Air-driven drum agitator . . . is designed for use in hazardous atmospheres where explosive mixtures are being used. Units are low-cost, portable, and can be mounted quickly on any 55-gal drum. Two motor sizes are available, rated as ¼-½ hp, 1/3-1¼ hp. Mixing speeds vary from 500 to 2000 rpm, depending on air pressure used.

(Air-driven drum agitators are product of Prenco Products Inc., 507 E. 10 Mile Road, Hazel Park, Michigan.)

Check 2456 opposite last page.

Continuous reactor pairs efficient heat transfer with constant mixing

Units can be built to operate at 1000 psi, 750°F

Uses: Conducting continuous reactions such as sulfonations, polymerizations, emulsifications, and similar processes requiring continuous mixing and accurate temperature control.

Features: Standard machines operate at pressures up to 350 psi and temperatures from 32 to 400°F. Units can also be furnished with working pressures up to 1000 psi and temperature up to 750°F.

Description: Continuous process machine consists of series of fixed heat transfer plates through which a heat transfer fluid is circulated. Plates may also be electrically heated, if desired.

Spaced between each plate are beaters mounted on a common shaft. Beaters intensively mix, in a relatively

To page 174

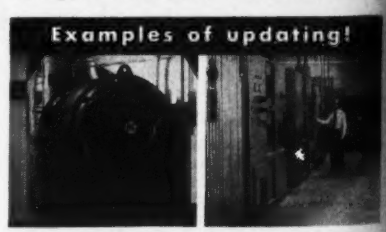
ALLIS-CHALMERS

ALLIS-CHALMERS

NEW brochure of ideas for modernizing

This booklet is based on the premise that modernization can start anywhere in your plant. It can be a single machine or operation . . . a better way of getting variable speed . . . a faster way to braze . . . or a newly available replacement. In fact, this type of updating is far more common than the sweeping change.

Get a copy of "59 ideas for modernization in '59" from your nearby A-C office or write Allis-Chalmers, Industries Group, Milwaukee 1, Wisconsin.



New motor development may eliminate premiums you've been paying for specially protected motors.

Electrical modernization includes placing substations close to machines being served.

ALLIS-CHALMERS

A-5850

Check 2457 opposite last page

Built to handle YOUR hot pumping job

Here's a *right* line of pumps from Allis-Chalmers for high temperature applications. These oil-lubricated models are of simplified design for easy maintenance — yet offer every feature needed for low-cost handling of hot and corrosive liquids.

Look at these features:

- A wide range of ratings up to 3500-gpm capacity, with heads to 550 feet.
- Impeller material as required — bronze, iron, stainless steel, high nickel alloys and other alloys.
- Get reliable double-row ball bearings guarded by constant level oiler which permits continuous lubricant surveillance.
- Sealing arrangement available from a variety of packings and mechanical seals.

Pump, motor and control are available as a unit from Allis-Chalmers. See your A-C representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5778

Moved Recently?

If you have, you will want to make sure that your copy of CHEMICAL PROCESSING will continue to come to you on time.

Maybe . . .

you have received a promotion and have been transferred to a new location.

Or, if you have changed your affiliation, we want to make sure that your copies of CHEMICAL PROCESSING will follow you.

Fill out . . .

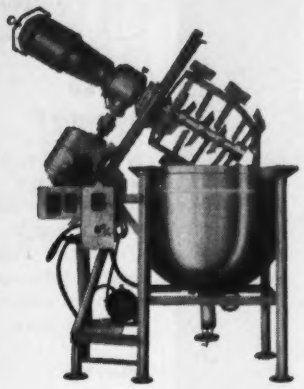
the slip opposite the back cover. Be sure to answer all questions regarding your new location, title, and company.

In addition, give us your former address, including company, city, state.

Mail this slip to the Reader Service Department and we will make sure you will continue to receive each issue of the magazine promptly.

For more information on product at left, specify 2458 see information request blank opposite last page.

This typical G-W Eppenbach Agi-Mixer is fully jacketed. Hydraulic lift raises mixing assembly. Contact parts are stainless steel.



only Agi-Mixers give

HOMOGENIZING PADDLE MIXING

at the same time!

...That's why hundreds of users have found G-W Eppenbach Agi-Mixers just about the most useful processing equipment they possess.

Rotating paddles with teflon scraper blades work unrefined material down from the edges and top of the kettle to the high-speed, high shear Homo-Mixer homogenizing head. Here the material is drawn through small clearances between a precision turbine and stator, and ejected upward against an adjustable deflector plate. At this point the paddles again direct the material down, and this cycle is repeated until the entire mass is properly homogenized and blended.

G-W Eppenbach Agi-Mixers are built for rugged, exacting, time-saving service, and have scores of uses in processing pastes, creams, batters, slurries, gums, adhesives, pigments, resinous and latex compounds, and other viscous products. 3810

Use coupon for free 24-page Fact Book describing the whole unusual Eppenbach line.

GIFFORD-WOOD CO.
Dept. CP-11
Hudson, New York
Please send me your free Eppenbach Fact Book.
Name:
Title:
Company:
Address:
City: State:

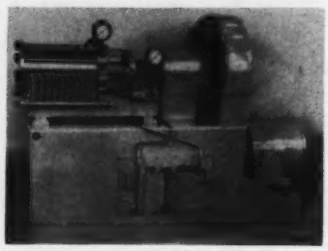
Check 2459 opposite last page

PROCESSING EQUIPMENT

From page 172

small volume, material flowing through channels of each plate. High degree of turbulence produced results in formation of thin films, with corresponding high heat transfer coefficients.

Two standard sizes are available, having 11 and 18" diam heat transfer plates. Normal construction is stainless steel, but other metals may also be specified.



Continuous reactor has many potential applications in chemical, food, and allied industries

Complete unit can be disassembled easily without use of special equipment. Heat transfer plates, beaters, and other parts are interchangeable with other machines of same size.

(Flowmaster reactor was developed by Chemical Machinery Division of Baker Perkins Inc., 1000 Hess, Saginaw, Michigan.)

Check 2460 opposite last page.

Classifying systems of high efficiency are illustrated and explained in two-color bulletin. Including line drawings, graphs, and installation photos, bulletin explains general operating characteristics of both centrifugal and gravitational classifiers. Curves illustrate high efficiencies achieved in actual field installations and indicate particle size distribution of incoming feed, separated fines, and coarse material. "Buell High Efficiency Classifying Systems" — Buell Engineering Company, Inc., 123 William St., N.Y. 38, N.Y.

Check 2461 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

for heavy duty service

ROCKWELL "WAFER" VALVES

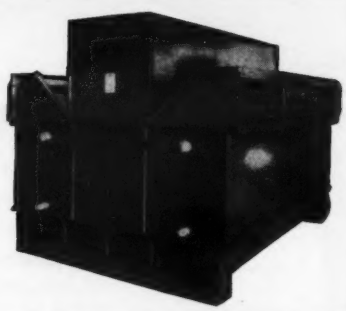
Wafer valve with air motor operator. *Right* — rubber-lined wafer valve with hand wheel control.

Compact, space-saving butterfly valves for dependable throttling and wedge-tight shut-off of air, gas, liquids and semi-solids at differential pressure to 150 psi and temperatures from minus 50° to plus 600°F. and higher. Manual or automatic operators. Standard sizes to 36" and larger special sizes. Write for Bulletin 580.

W. S. ROCKWELL COMPANY
2208 ELIOT STREET • FAIRFIELD, CONN.
Sales Representatives in Principal Cities

Check 2462 opposite last page

NIAGARA SECTIONAL *Aero* HEAT EXCHANGER gives close temperature control, saves you LABOR, Power, Water



- Because the new design improves the heat transfer to the out-door air by evaporation.
- Because new features keep your equipment working for long life with "new plant" efficiency . . . always full capacity.
- Because you save 95% of cooling water cost.

You get faster, more accurate cooling of industrial fluids to specify temperatures.

You improve your quality of production by removing heat at the rate of input.

You save labor in upkeep. With full access to all interior parts and piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 7,000,000 to 18,000,000 Btu/hr. No other heat exchange method gives you so much saving in money and convenience.

Write for Niagara Bulletin No. 132

NIAGARA BLOWER COMPANY
Dept. CP-11, 405 Lexington Ave., New York 17, N.Y.
District Engineers in Principal Cities of U. S. and Canada

Check 2463 opposite last page

ALLIS-CHALMERS

NEW grinding plant

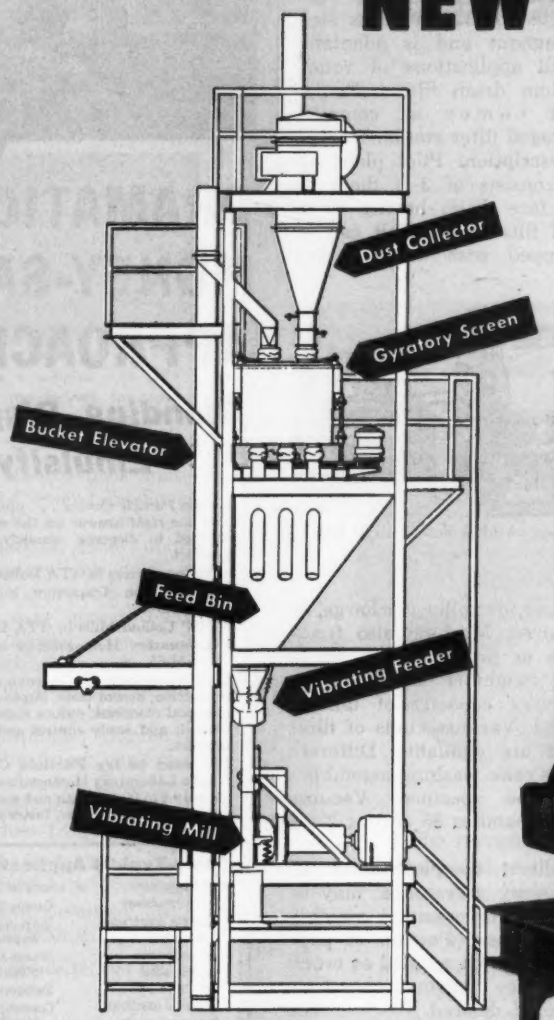
15 to 30 times more capacity

50% less space required

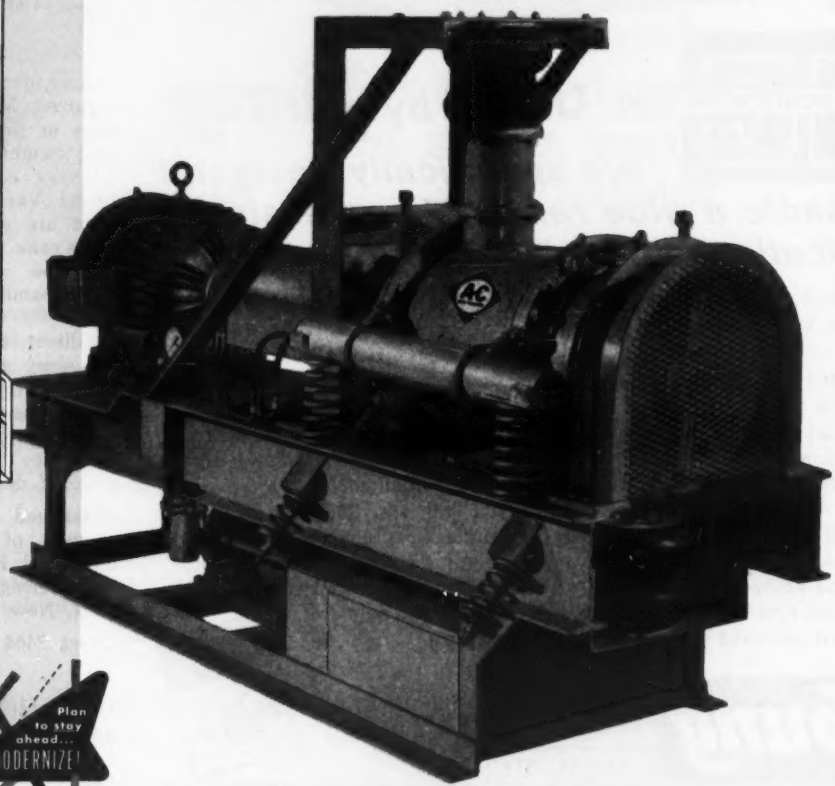
a complete "package" — at a surprisingly low cost

You can now process as much as one ton per hour of dry materials within less than 127 square feet of floor space with this new Allis-Chalmers Grinding Plant. Plant components are designed, applied and "coordineered" to handle materials in a 30 to 300 lb per cu ft range. Vibrating mill out-produces a tumbling mill 15 to 30 times per unit volume. The plant is a complete pre-engineered "package" that affords the low price tag of an off-the-shelf item, and built-in flexibility offers tailored-to-the-job performance.

Operating economy, accessibility, cleanliness and easy maintenance of the entire plant are other advantages.



Plant includes structural steel, platforms, ladders and processing equipment, motors, and drives — everything match-marked for convenient erection.



Plan to stay ahead... MODERNIZE!

Check 2464 opposite last page

Your local A-C man will give you all the details. Or, write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis.

ALLIS-CHALMERS

A-5849

The cooling of liquids and gases or condensing vapors by air is the economical answer to many heat transfer problems!

HC® HORIZONTAL CORE UNITS by Young

are specifically designed to handle a wide range of processing applications normally cooled by water!

HC® (Horizontal Core) Units are high-capacity, forced-draft air-cooled heat exchangers featuring vertical air discharge.

They are ideal for cooling acids, light or heavy end liquids, caustics, oils, or for condensing vapors or steam, or for maintaining temperature control of various types of solutions.

They are available in a wide range of sizes with capacities up to 25,000,000 Btuh for cooling water, or 10,000,000 Btuh for cooling oil. Parallel series installations of units can give unlimited cooling capacities. All units come equipped with motor and fans. They can be furnished with such optional accessory equipment as shutters, walkways and ladders, pumps, expansion tanks, thermostatic by-pass controls or air and sediment traps where required. Whatever your temperature problem, check with Young . . . they can help you solve it and save you money at the same time.

Write for catalog No. 557 Dept. 378L

Young RADIATOR COMPANY
RACINE, WISCONSIN
Creative HEAT TRANSFER ENGINEERS
Executive Offices: Racine, Wisconsin. Plants at Racine, Wisconsin, Mattoon, Illinois

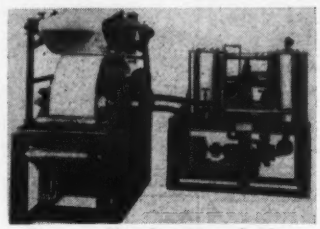
Check 2465 opposite last page

Packaged filter unit is fully equipped, all stainless

Uses: Pilot plant or limited production filtration of various materials in chemical and allied industries.

Features: Unit is constructed of 316 stainless steel throughout and is adaptable to all applications of rotary vacuum drum filters. Equipment comes as complete packaged filter station.

Description: Pilot plant filter consists of 3-ft diam by 1-ft face drum having 10 sq ft of filter area. Unit can be equipped with either string, scraper, or roller discharge, as required. Machine also functions as precoat filter. Shipping weight is 1450 lb.



Drum on filter has 10 sq ft filter area

Slurry capacity of unit is 20 gal. Various kinds of filter cloth are available. Different types cake washing assemblies may be specified. Vacuum pump handles 35 cfm at 22 in Hg.

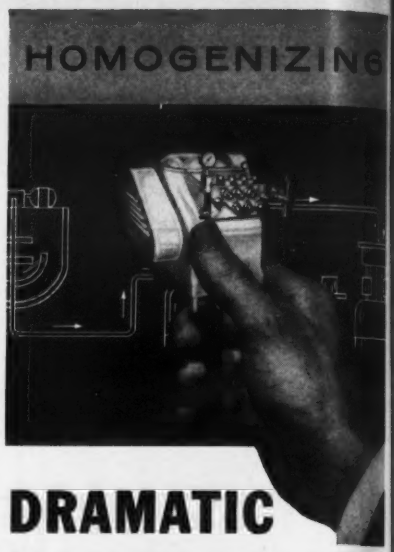
Filters, complete with all necessary accessories, may be obtained on nominal monthly rental basis. Portion of payments can be applied as credit allowance against purchase price, if desired.

(Packaged filter stations are product of Industrial Filter Division, Komline-Sanderson Engineering Corporation, Peapack, New Jersey.)

Check 2466 opposite last page.

Agitating equipment is described in 16-page catalog that introduces new items added to manufacturer's line of laboratory and production agitators. Agitator Cat — Eclipse Air Brush Company, 390 Park Ave., Newark 7, N. J.

Check 2467 opposite last page.



DRAMATIC MONEY-SAVING APPROACH TO

Blending, Dispersing, Emulsifying

Gaulin *Particle Control* . . . plus GTA . . . gives you the *right* answer on the most inexpensive method to disperse, emulsify or blend your product.

- Homogenizers in GTA Bulletin H-55.
- Sub-Micron Dispersers in GTA Bulletin SMD-55.
- RE® Colloid Mills in GTA Bulletin C-57.
- Laboratory Homogenizers in GTA Bulletin LH-55.

GTA shows how to: Improve uniformity; stop separation; accent taste; improve texture; speed chemical reactions; reduce amount of materials needed; and easily control and duplicate your product.

It's easy to try Particle Control. Rent a Gaulin Laboratory Homogenizer or Colloid Mill for only $75.00 a month and see how your product can be made better, faster and cheaper.

Some Typical Applications of GTA

Wax emulsions	Leather finish
Resin emulsions	Carbon black dispersion
Pigment dispersion	Vinyl-pigment dispersions
Adhesives	Grease and petroleum production
Fat emulsions	Suspensions
Experimental coating colors	Cosmetic and hand cream blending
Chemical reactions	Soap processing
Pharmaceuticals	Latex compounding
Dope dyeing	
Light ink dispersions	

Gaulin TRADE MARK
MANTON Gaulin

Manton-Gaulin Manufacturing Co., Inc.
55 Garden Street, Everett 49, Mass.
World's largest manufacturers of high pressure pumps, homogenizers and colloid mills.

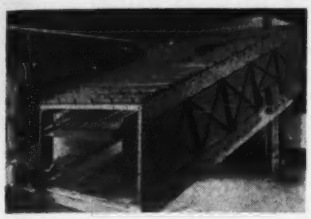
Check 2468 opposite last page

Totally enclosed screens assure clean operation, cut dust losses

Uses: Screening various pulverized materials in chemical and allied plants.

Features: Screens are totally enclosed, resulting in clean, dust-free operation.

Description: Equipped with air springs, new line of vibrating screens are available in



Screens are equipped with side doors and top covers for easy access to all portions of unit

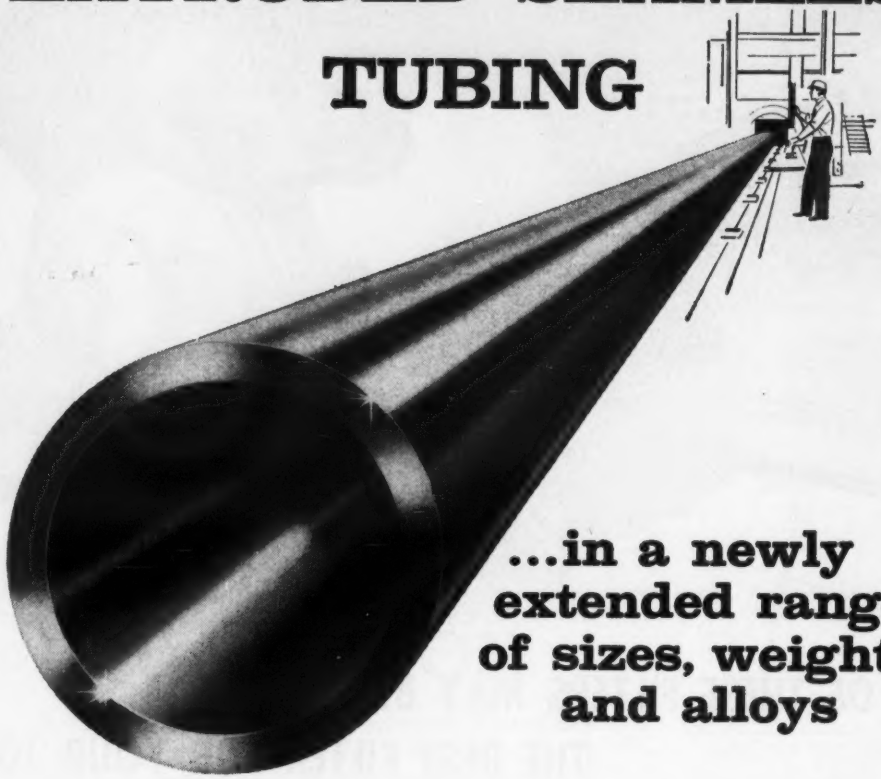
single and double-deck models. Standard open-type floor-mounted units have stationary frame enclosure. Side doors and top covers are held in place with quick-opening latches for easy access to all portions of screen.

Where desired, an exhauster outlet can be provided in top of enclosure. Enclosure is bolted to stationary discharge spouting. Provision can also be made for bolting fines hopper to supporting frame for maximum dust-free operation.

(Model SH Ripl-Flo screens are product of Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin.)

Check 2469 opposite last page.

Curtiss-Wright EXTRUDED SEAMLESS TUBING



...in a newly extended range of sizes, weights and alloys

The recognized advantages of Curmet extruded steel tubing...*high transverse strength, uniform physical properties, longer lengths* . . . are now available for the first time to a wide range of industrial applications.

Technological advances at Curtiss-Wright's Metals Processing Division have now made possible:

- Sizes from 8 through 20 inch outside diameters, and even larger, in quarter inch increments.
- Materials include premium carbon steels, alloy steels, stainless steels and high temperature materials.
- Wall thicknesses from A.S.A. Schedule 20 through Schedule 160, and larger sizes through 4 inches.

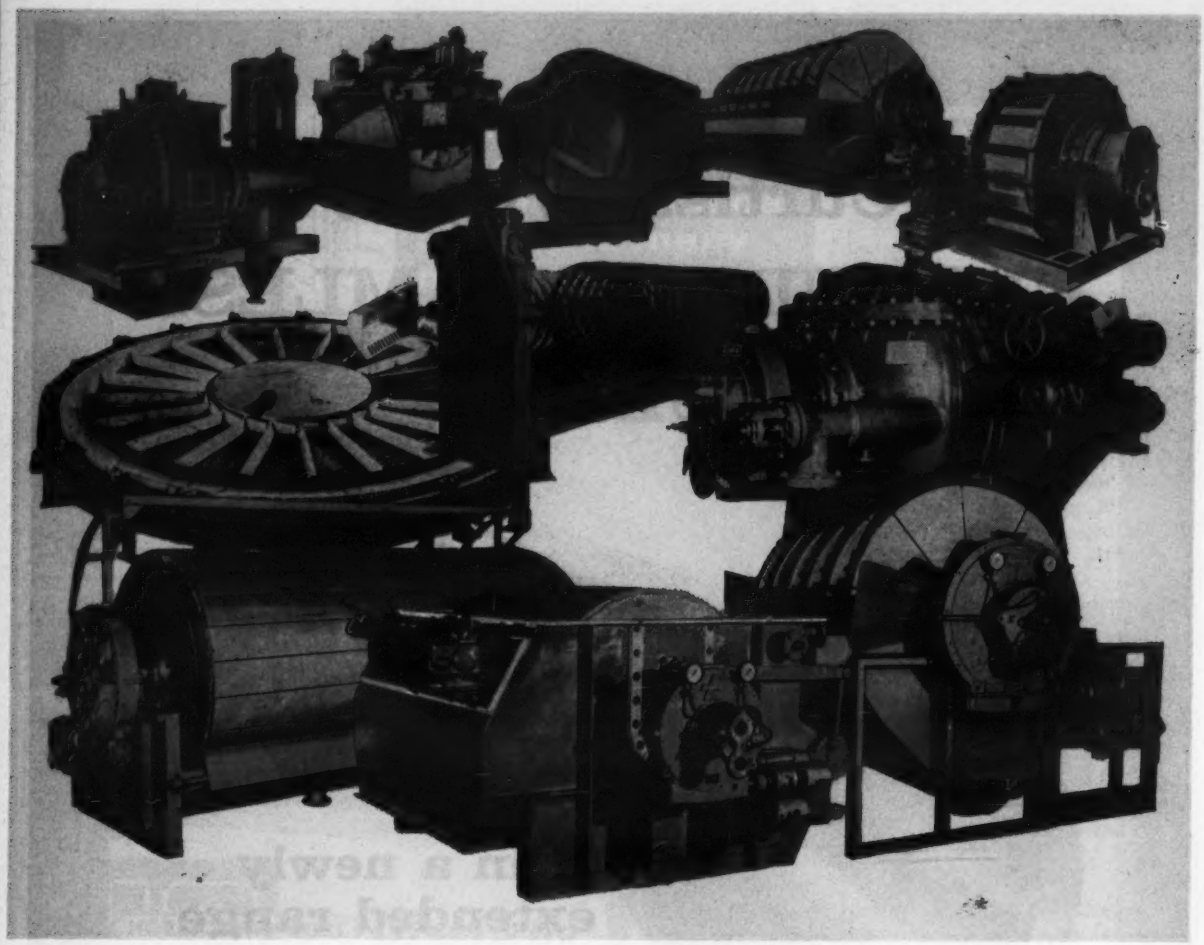
New latitude in fabrication and closer matching of dimensional needs enable you to use this high-integrity tubing in an expanded range of pressure, temperature and mechanical applications . . . with new economy.

FOR FULL INFORMATION, WRITE TO:

METALS PROCESSING DIVISION
760 Northland Avenue

CURTISS-WRIGHT CORPORATION
Buffalo 15, New York

Check 2470 opposite last page



ONE OF THESE FILTERS MAY BE THE BEST FILTER FOR YOUR JOB

The picture of various types and sizes of continuous vacuum and pressure drum, disc, pan, plate and frame, top feed, precoat, string discharge, and other specialized filters — are but typical of the careful and extensive work which goes on in Eimco's large, modern engineering and manufacturing departments.

This is the final evidence that each process must use specialized equipment to produce the maximum product at the lowest possible cost.

Users of Eimco processing equipment for liquid-solids separation will tell you that the extra quality of Eimco design and workmanship pays dividends through helping them achieve uniformly efficient results with a faster investment payoff through lower operating costs.

THE EIMCO CORPORATION
SALT LAKE CITY, UTAH
Research and Development Division, Palatine, Illinois • Process Engineers Inc. Division, San Mateo, California
Export Office: Eimco Building, 51-52 South Street, New York 5, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD
B-349

Check 2471 opposite last page

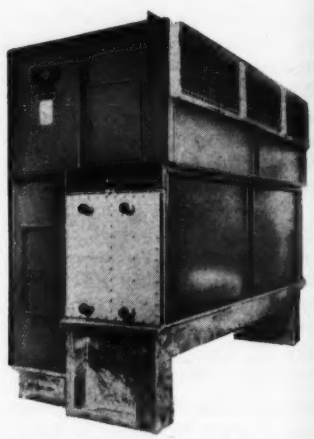
Liquid-gas cooler can be used either indoors or outdoors

Uses: Cooling various liquids and gases.

Features: Heat exchanger has "winter-summer" dampers that permit outdoor installation in severe climates with no danger of freezing damage. Coils are easily removed.

Description: Units are available in range of sizes providing up to 18 million Btu/hr cooling capacity under standard conditions. In operation, evaporation of water spray over cooling coils provides cooling effect at rate of about 1000 Btu for each pound of water evaporated.

Air stream, which rejects heat, enters heat exchanger near top of one side. Air then travels downward through spray chamber, drawn upward through plenum, and discharged by propeller fans.



Heat exchanger can remove up to 18 million Btu/hr under standard conditions

Fluid is cooled to point close to atmospheric wet bulb temperature. Control of temperature is completely automatic, governed by modulating amount of air flow of fresh or recirculated air. Removable panel sections on unit permit easy maintenance.

(Aero heat exchangers are product of Niagara Blower Company, 405 Lexington Avenue, New York 17, N.Y.)

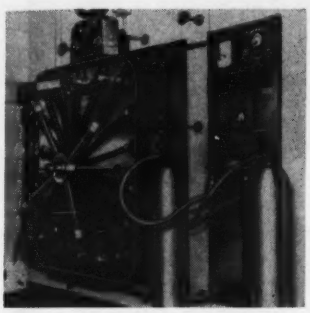
Check 2472 opposite last page.

Fast sterilizations with efficient gas equipment

Uses safe gaseous mixture of ethylene oxide, CO_2

Uses: Sterilizing materials that cannot safely be sterilized with steam.

Features: Equipment performs fast, efficient sterilizations using a safe gaseous mixture of 10% ethylene oxide and 90% carbon dioxide. Except for loading and unloading, all operations and cycling are automatically controlled to precise limits.



Except for loading and unloading, all operations and cycling are automatically controlled on gas sterilization unit

Description: Cabinet, open-, or recessed-mounted units are available in various chamber sizes ranging from 16x16x24" to 60x66x120". All equipment is available with single door, or as double-door units, with interlocks if desired. Most units are also available with dual controls and piping for stream as well as gas sterilizing.

(Cry-O-THERM gas sterilization equipment is product of American Sterilizer Company, Erie, Pennsylvania.)

Check 2473 opposite last page.

Separation and clarification of liquids using centrifugal separators are discussed in eight-page, four-color catalog. Three specific units are described, including technical description of concentrate recycle process. Tables of rated capacities, applications, and advantages are presented in Bul 2414 — Centrico, Inc., 75 West Forest Avenue, Englewood, New Jersey.

Check 2474 opposite last page.

the

MIKRO-PULSAIRE* COLLECTOR

Successful processing operations demand around-the-clock dust collection and full-time automatic cleaning . . . with no interruptions for maintenance. Jet-action MIKRO-PULSAIRE answers these requirements . . . does a better job at less cost. There are no internal moving parts to cause tie-ups . . . extra-long filter media life is assured . . . and MIKRO-PULSAIRE shows a performance-proven filtering efficiency of 99.9% *plus!* Bulletin 52A gives full facts and figures. It's yours for the asking.

For additional product information and location of the MIKRO-MAN nearest you, see Chemical Engineering Catalog for 1958, pgs. 1467 to 1474.

ASK THE MIKRO-MAN TO CALL!

We'll arrange a working demonstration of the MIKRO-PULSAIRE Model Unit right in your own plant or office . . . working on your own materials. Write for details.

A COMPLETE LINE OF UNITS FOR ALL COLLECTION JOBS, FEATURING:

- Continuous, automatic cleaning
- Ease and simplicity of maintenance
- No internal moving parts
- No shaking or frictional action on filter
- Efficiency 99.9%+

Mikro-D

PULVERIZING MACHINERY DIVISION
METALS DISINTEGRATING COMPANY, INC.
60 Chatham Rd., Summit, New Jersey

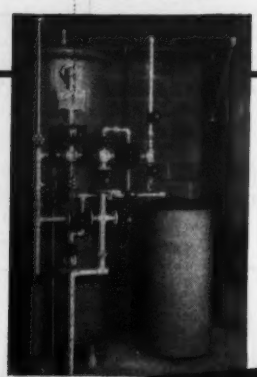
GENUINE MIKRO-D REPLACEMENT PARTS AVAILABLE FROM LARGE STOCK WITHIN 48 HOURS

Check 2475 opposite last page

21¢ PER 1000 GALLONS FOR

Demineralized water better than

DISTILLED WATER



ELGIN
Single-Tank, Mixed-Bed
DEIONIZER

What are you paying for distilled or evaporated water? The Elgin Ultra-Deionizer has brought the cost of water, freer from mineral impurities than distilled water, down to the low price quoted above (based on 10 grain water).

It removes all ionizable impurities . . . including CO_2 and silica.

Low investment and operating cost.

Requires less space . . . **thanks to exclusive "double-check" design.**

ELGIN WATER CONDITIONING — 50th Anniversary 1963

Zeolite Water Softeners
Dealkalizers
Deaerating Heaters
Filters of all types
Water Conditioning Products for every need.

Write for Bulletin 512

ELGIN SOFTENER CORPORATION
180 N. GROVE AVENUE • ELGIN, ILLINOIS

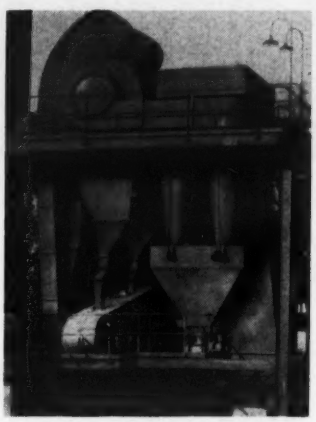
Check 2476 opposite last page

PROCESSING EQUIPMENT

Removes 98%+ of fines smaller than 325 mesh with no oversize

Centrifugal classifier has no moving parts

Uses: System is recommended for classification applications in the 400-200 mesh range. It can be used to classify chemicals, resin powders, fluid catalysts, salts and crystals, fillers, fibers, fertilizers, and other pulverized products. Units are available in sizes to handle from 100 pounds to 100 tons of feed material per hour.



Installed classification system. Such systems have increased mill outputs from 10 to 300%

Features: Centrifugal classifier system attains efficiencies hitherto unattainable in commercial practice. It will extract from most feed materials more than 98% of very fine particles having diameters smaller than 325 mesh, with no oversize material in the fines.

Unit has no moving parts, requires virtually no maintenance. Power requirements are 0.04 to 0.5 fan hp per ton of feed per hour.

Description: In operation, feed material and gas, usually air, enter classifier through a sharp bend at top. Air and feed are separated by centrifugal force, the air stream passing behind a baffle plate. Feed strikes the baffle and forms a falling cur-

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Beloit, Wisconsin

Check 2477 opposite last page

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Fine or Coarse
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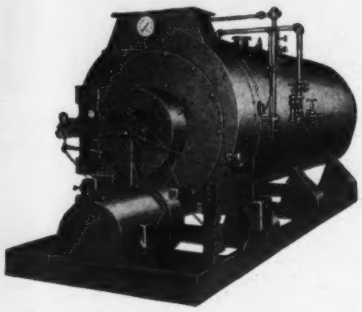
Check 2478 opposite last page

COUNT 'EM!

CYCLOTHERM CUTS STEAM PROCESSING COSTS 3 WAYS!



1. FUEL COSTS Cyclotherm Cyclonic Combustion means just what it says — controlled fuel and air, whirling at 200 mph, forming a cyclone in the furnace! This high velocity burning assures maximum efficiency in combustion and heat transfer, resulting in lower fuel consumption.

2. MANPOWER COSTS A fire without a fireman! Electronic controls operate the Cyclotherm safely and automatically. Smaller models cycle on and off as steam is required. On larger models, precision modulation coordinates the fuel-air ratio to the load demand, from 30% to 100% of rated capacity.

3. INSTALLATION AND MAINTENANCE COSTS Cyclotherm is factory assembled and factory pre-tested. All you do is make five simple connections. 50% maintenance savings are not uncommon. Return tubes cleaned in minutes with no removal or replacement of refractories. No standby unit needed.

And remember—one-third smaller than ordinary generators of similar capacity, a Cyclotherm fits almost anywhere. Many plants have installed two Cyclotherms for utmost flexibility and power. Burns gas or oil with quick changeover. 15 to 750 hp, 15 to 400 psi.

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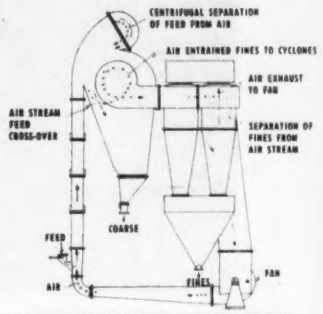
Check 2479 opposite last page

tain. The air stream then crosses this curtain resulting in an intense scrubbing action separating fine particles from tailings, breaking up agglomerates, and subjecting all particles to an equal drag force.

Very large particles, if present, are immediately precipitated by gravity to bottom of classifier. Intermediate and



CENTRIFUGAL CLASSIFIER IN CLOSED CIRCUIT

finer particles flow with gas stream in a spiral path around exhaust orifice.

Each particle is acted upon by centrifugal and drag forces. Centrifugal force tends to move particles towards periphery of chamber and is opposed by drag force. Under set conditions, centrifugal force will equal drag force for particles of a particular diameter. This diameter is referred to as the "cut point"

Larger particles are propelled outward to peripherial walls of classifying chamber, impinge and fall by gravity to bottom. Smaller particles are swept inward and discharged with gas stream through outlet orifice to a cyclone separator.

To obtain sharp separation, classifier chamber is designed so that forces acting on particles will be in equilibrium at all points within classifying zone. Appropriate chamber proportions and orifice design eliminate normally detrimental frictional drag effect of classifier side walls without recourse to moving parts.

(Centrifugal classifier system is a product of Buell Engineering Company, Inc., 123 William Street, New York, New York.)

Check 2480 opposite last page.

SPERRY

is the low cost answer to all your FILTRATION PROBLEMS

Consider all the money-saving aspects of a Sperry Filter Press. These include low initial cost . . . nominal installation . . . minimum maintenance . . . low depreciation . . . and an economy of operation that extends through many years of trouble-free performance.

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You can avail your plant to the economies of a Sperry Filter Press, custom-engineered to meet your particular requirements for flow rate, cake build-up, washing, extraction, thickening, etc. Variations are provided, offering center, side or corner feed; open or closed delivery; simple or thorough washing; high or low temperature control. Plates may be had in aluminum, wood, iron, bronze, stainless steel, lead, rubber, nickel or any other special materials to meet your requirements. Any filter media can be used . . . cloth, synthetics, wire screen . . . paper. Labor-saving plate shifting devices and semi-automatic closing attachments are adaptable for any model . . . to increase production, minimize operation hazards and reduce wear and tear.

FOR A LOW-COST ANSWER TO YOUR FILTRATION PROBLEMS, SEE THIS SPERRY CATALOG . . . an up-to-date fully illustrated reference manual of erection, operating, design and construction data and specifications. Mail coupon for your free copy today.

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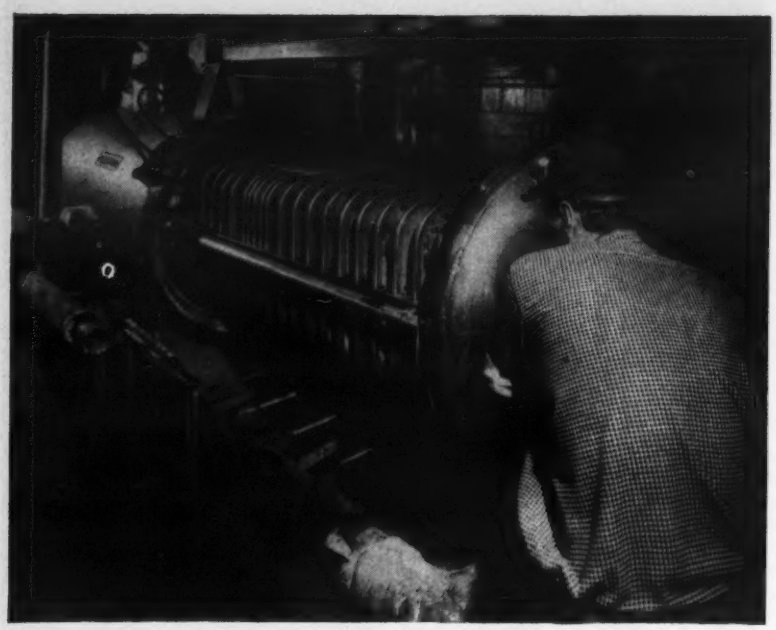
Check 2481 opposite last page



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FASTER CLEANING . . . Some users report as much as 50% reduction in downtime with Niagara Filters. This unit, in sizes up to 2000 sq. ft. of filter area and 250 cu. ft. of cake capacity, can be cleaned by ONE MAN in a matter of MINUTES.

LESS MAINTENANCE . . . Niagara Filter users gain here, too, because of this filter's simple, efficient design. All Niagara Filters are designed and built in strict accordance with the A.S.M.E. Code. For details as they apply to your processing problem, see the Chemical Engineering Catalog or write today describing your requirements.

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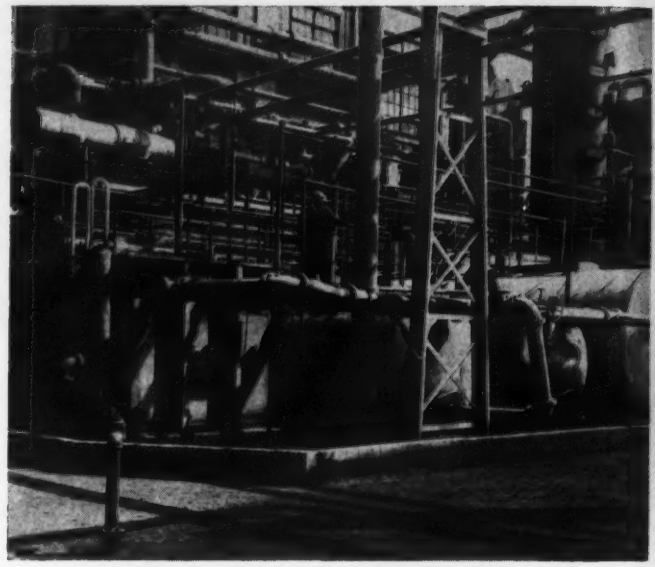
Specialists in Liquid-Solids Separation

Check 2482 opposite last page



Safety director inspects one of 66 foam-making spray heads on 2200' above-ground pipe system. One of six foam-hydrants located throughout area is shown in foreground

Foamed fire protection system saves benzol plant move

Problem: As the Neville Island, Pa., plant of Pittsburgh Coke & Chemical Company expanded, benzol production facilities became surrounded with other processing equipment and buildings on the 150-acre site.

This produced an intolerable situation which left management with two choices. Either the benzol plant would have to be moved to a less congested area, or fire protection equipment would have to be provided that would meet insurance company requirements and minimize the fire hazard.

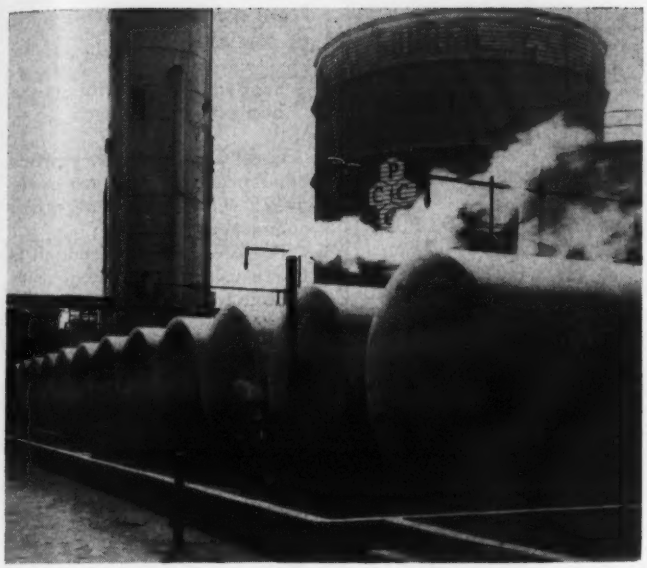
Since benzol production is a vital intermediate step in production of many of Pittsburgh Coke's chemicals, it was not feasible to move the plant.

Solution: A special-hazards foam fire-protection system was installed. The installation consisted of five individual systems subject to manual control from the foam house, and a hydrant system with six foam hydrants located throughout the area. At these points, hose and playpipe may be attached to apply foam manually to areas not within range of fixed nozzle system.

Sixty-six foam-making spray-head units, two tank-side foam makers, and three 2½" playpipes are included.

System was designed to provide at least 50-psi water pressure at any foam-making unit. It protects, at one time, the largest area, consisting of 16 horizontal tanks, 10' in diameter and 34' long, mounted in a 50 by 150' dyked area, plus an additional 25' square containing one horizontal tank. Tanks range in capacity from 20,000 to 50,000 gal.

Area requires a water flow rate of 1280 gpm, intermixed



Horizontal tanks, mounted in 50 x 150' dyked area, are in one of five areas protected by fixed-pipe foam system

Processing, storage tank areas protected by zoned installation

with 38 gpm of foam compound. To provide enough foam compound to supply this area, 1735 gal of compound had to be stored.

Foam compound is of a type known as 3 percent low expansion. This means that 3 gal of compound are mixed with 97 gal of water to produce foam solution. Solution is applied at rate of 1/10 gal per square ft of surface area protected. Nearly 500,000 gal of actual foam blanket could be produced with quality of foam stored. This would cover 120,000 square ft of level surface with a foam blanket 6" deep.

Foam compound is stored in 2000-gal tank located inside concrete-block foam house. It is drawn from tank by an electrically operated 40-gpm pump. By system of orifice plates and manually operated valves, proper amount of compound can be introduced into water stream being directed to any particular area.

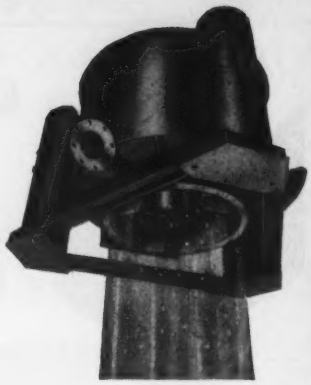
As part of safety program, complete foam system is gone over every three months with all operating and maintenance men assigned to the division. System itself is tested once a year, with water only outside the tanks, and foam in the hydrants.

Results: Foam fire protection system covers processing equipment and storage tanks occupying more than an acre, giving company zoned fire protection in a critical area. Costly benzol plant move is avoided.

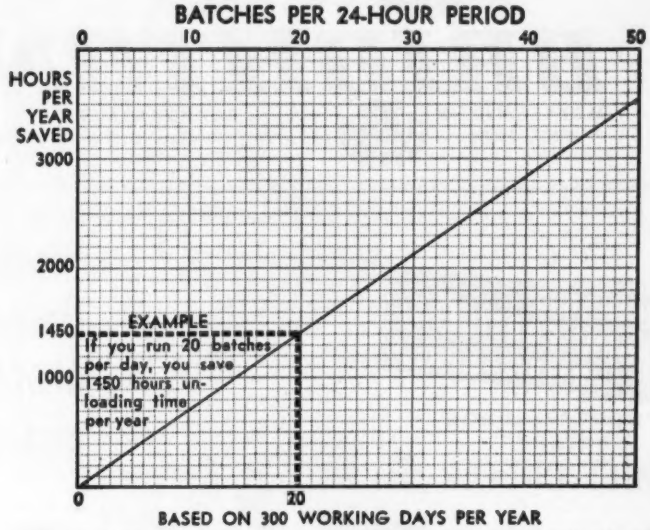
(Special-hazards foam system was engineered and installed by Blaw-Knox Company, 300 Sixth Avenue, Pittsburgh 22, Pennsylvania.)

Check 2483 opposite last page.

PREDICT the centrifuging hours you save in a year



This most revealing chart quickly shows how much unloading time you can actually save, with Batch-Master's® rapid bottom discharge and hydraulic unloader. The chart is based on Batch-Master's unloading time (30 seconds average) . . . as compared with that of a manually unloaded batch centrifugal (15 minutes or more). If the chart gives you a jolt, investigate Batch-Master.



BASED ON 300 WORKING DAYS PER YEAR

FOR MORE COMPLETE DATA, SEE TOLHURST'S SECTION IN CHEMICAL ENGINEERING CATALOG or write

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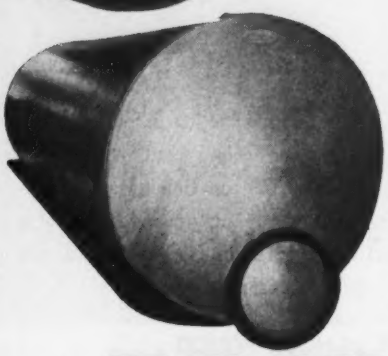
Check 2484 opposite last page



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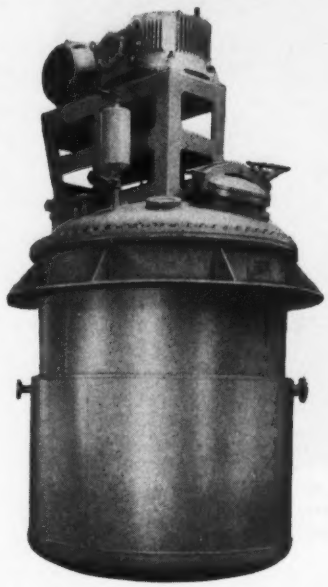
Brighton Fabrications Meet Modern Requirements for . . .
Chemical, Food, Paint, Pharmaceutical and Allied Processors

For more than four decades Brighton has fabricated equipment for the processing industry. From our modern and completely equipped plant, Brighton craftsmen build small tanks, large tanks, special tanks from all types of alloy metals.

Typical fabricating jobs include: fractionating columns, reactors, pressure vessels, (jacketed or unjacketed) coils, agitators, kettles, tanks, evaporators. Special machines weld, bend, flange, roll and form.

Brighton fabricates according to ASME code requirements. For creative engineering, craftsmanship and on time delivery of equipment, write for complete information. Prompt estimates on your fabrication requirements.



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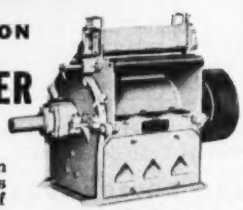
METALSMITHS EST. 1914 — CORPORATION — 820 STATE AVENUE · CINCINNATI 4, OHIO

Check 2485 opposite last page

FOR GRANULATING
UNIFORM PARTICLES
IN LARGE VOLUMES!

SPROUT-WALDRON
ROTARY
KNIFE CUTTER



Write for Bulletins 141 & 101

The Sprout-Waldron Knife Cutter produces granular particles of more uniform size than is obtainable through most other types of machines . . . at great capacities. Unique arrangement of knives and screens assures clean-cut uniform particles. Customary frictional heat is reduced. Ideal for pre-cutting rags or leather . . . flocking continuous strips of alpha pulp . . . granulating cork or thermoplastic stock . . . and for hundreds of other uses.

For all other problems, too, involving single or combined phases of size reduction, Sprout-Waldron has your one best answer. Complete lines of crushers, hammer, roller, and attrition mills, and equipment for feeding and removing materials from these units are available. And our long years of experience in planning and designing size reduction installations are at your service. Write for details.

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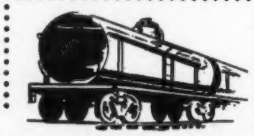
Manufacturing Engineers Since 1866
LOGAN STREET • MUNCY, PA.
EQUIPMENT FOR SIZE REDUCTION—MIXING & BLENDING — BULK MATERIALS HANDLING — PELLETING & CUBING — PRODUCT CLASSIFICATION

IN/501

Check 2486 opposite last page

Unusual phenolic coatings protect tanks and drums



Series B-124 Unichrome Phenolic Coatings offer reliable and durable lining for tank cars, storage tanks, and processing equipment.

Some coatings in this series deposit films twice as thick as ordinary phenolic coatings. One has a built-in "cure control." By *color*, it indicates the completeness of curing.

For rough and tumble service in drums, a Unichrome phenolic lining gives reverse impact resistance superior to ordinary phenolics.

Many companies who can give you fast service specialize in applying Unichrome Tank and Drum Linings. For name of one nearest you, contact Metal & Thermit. Also, send for Bulletin Chem-C-2.

PLATING MATERIALS
ORGANIC COATINGS
TIN & TIN CHEMICALS
CERAMIC MATERIALS
WELDING SUPPLIES
METALS & ALLOYS
HEAVY MELTING SCRAP

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY
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In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

Check 2487 opposite last page

Glove protects hands from acids, solvents at low cost

Rugged enough for re-use and easy to slip on

Uses: Plastic gloves provide hand protection against acids, dyes, solvents, and most chemicals.

Features: Rugged enough to be re-usable and inexpensive enough to be disposable, gloves

Pre-talcumed polyethylene gloves slip on easily

are pre-talcumed for ease in donning.

Description: Handgards are made from 1¾-mil polyethylene, heat sealed. In rolls of 1000 cost is about three cents per glove. They are available in large, medium, and small sizes in rolls of 12 to 1000.

(Handgards can be obtained from Plasticsmith, Inc., PO Box 415, Concord, Calif.)

Check 2488 opposite last page.

No need to replace whole tube bundle when using plugs

Seals off leaking tubes, no tube-sheet damage

Uses: Sealing off corroded or leaking tubes in heat exchangers or condensers so that unit may continue to operate without replacing entire tube bundle.

Features: Dome-shaped driving surface on plugs insures concentricity in tube and virtually eliminates any possibility of damage to tube sheet.

Description: Tube plugs have precision-machined taper of 1°47′. They are available

in sizes from ½ to 1½" in diameter in a variety of materials for tube compatibility.

(Tube plugs are a product of Nuclear Products Co., 15635 Saranac Rd., Cleveland 10, Ohio.)

Check 2489 opposite last page.

Epoxy resin mixing made easier by dual package

Uses: Preparing epoxy resin adhesives at point of use for immediate extrusion on area or part to be repaired.

Features: Dual package permits uniform mixing of resin without contact with the skin or environmental contaminants.

Description: Two clear plastic containers, connected by a short length of plastic tubing, are used. One chamber contains a glass ampoule filled with prescribed curing agent; other has basic epoxy adhesive. Ampoule is broken, releasing agent which runs into adhesive chamber. Nylon-mesh strainer prevents glass particles from being transferred. Resin and agent are mixed by hand kneading. After mixing, connecting tube is cut and adhesive extruded by hand pressure.

Dual pack assures uniform epoxy resin formulating, free of contaminants

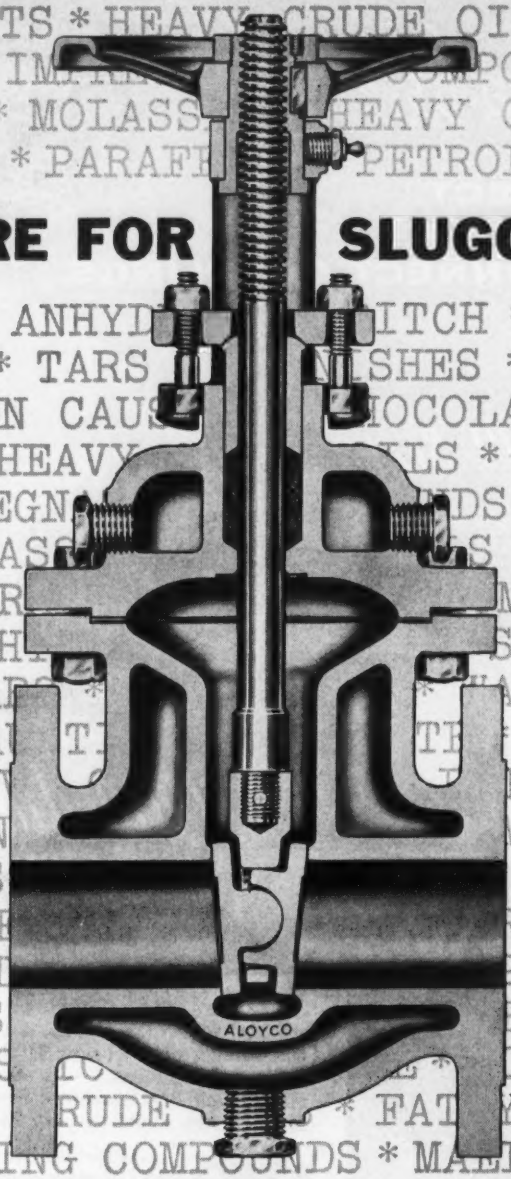
(Epoxy adhesive pack is a product of Fenwal Inc., Pleasant St., Ashland, Mass.)

Check 2490 opposite last page.

ASPHALT * MOLTEN CAUSTIC * CHOCOLATE * COAL TAR PRODUCTS * HEAVY CRUDE OILS * FATTY ACIDS * GUMS * IMPREGNATING COMPOUNDS * MAELIC ANHYDRIDE * MOLASSES * HEAVY OILS * HYDROGENATED OILS * PARAFFIN * PETROLEUM RESIDUES

SURE CURE FOR SLUGGISH FLUIDS

* PHTHALIC ANHYDRIDE * PITCH * SOAPS * MOLTEN SULFUR * TARS * VARNISHES * WAXES * ASPHALT * MOLTEN CAUSTIC * CHOCOLATE * COAL TAR PRODUCTS * HEAVY CRUDE OILS * FATTY ACIDS * GUMS * IMPREGNATING COMPOUNDS * MAELIC ANHYDRIDE * MOLASSES * HEAVY OILS * HYDROGENATED OILS * PARAFFIN * PETROLEUM RESIDUES * PHTHALIC ANHYDRIDE * PITCH * SOAPS * MOLTEN SULFUR * TARS * VARNISHES * WAXES * ASPHALT * MOLTEN CAUSTIC * CHOCOLATE * COAL TAR PRODUCTS * HEAVY CRUDE OILS * FATTY ACIDS * GUMS * IMPREGNATING COMPOUNDS * MAELIC ANHYDRIDE * MOLASSES * HYDROGENATED OILS * PARAFFIN * PETROLEUM RESIDUES * PHTHALIC ANHYDRIDE * PITCH * SOAPS * MOLTEN SULFUR * TARS * VARNISHES * ASPHALT * MOLTEN CAUSTIC * CHOCOLATE * COAL TAR PRODUCTS * HEAVY CRUDE OILS * FATTY ACIDS * GUMS * IMPREGNATING COMPOUNDS * MAELIC ANHYDRIDE



COMPLETELY JACKETED ALOYCO VALVES

Aloyco Jacketed Valves are the surest way to keep slow moving corrosives flowing because they maintain higher temperatures than valves heated by other methods.

Jacketed valves are made in a variety of sizes and pressures and are furnished with convenient inlet and outlet holes for heating with steam or other media. They are available in 18 8S, 18 8SMO, Aloyco 20 and other analyses to specification.

The broad Aloyco Valve line includes Jacketed Gate (above) Globe and Check Valves, the first Jacketed Valves ever integrally cast in high alloys. One more indication of Aloyco's leadership in pattern making, foundry techniques and engineering skills. Long experience in these areas has made Aloyco the world's foremost specialist in Stainless Steel Valves.

Ask Aloyco's Corrosion Engineering Service to work with you on your valve problems. Alloy Steel Products Company, 1302 West Elizabeth Avenue, Linden, New Jersey. 7.12

Longer Lasting **ALOYCO VALVES** FOR IN CORROSIVE SERVICE

ALLOY STEEL PRODUCTS COMPANY

Check 2491 opposite last page

Check 2492 opposite last page

Easy cleaning featured in start-up strainer for new lines

Uses: Protecting boiler-feed, condensate, and circulating pumps, and other equipment installed in new piping construction.

Features: Strainer has cleaning provision which cuts cleaning time from hours to ten minutes. Air, steam, or water lance is inserted to flush debris down cleanout drain.

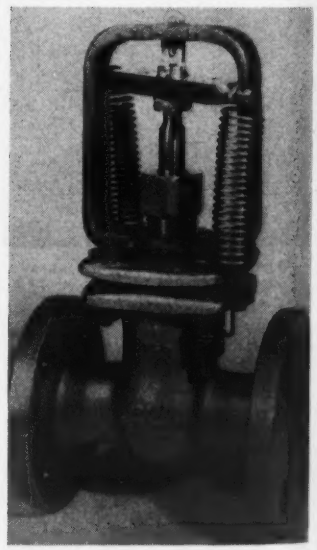
Description: Start-up strainer is available in 6" to 16" sizes with 150- or 300-lb flanges. Screen can be removed after lines are clean and unit left in piping system or entire strainer removed for reuse.

(Start-up strainers are a product of Leslie Co., Lyndhurst, New Jersey.)

Check 2493 opposite last page.

Spread of fires prevented by valve

Plant fires in one location can spread out of control when fed by process piping carrying additional combustibles to the area. Spring-loaded gate valve is designed to shut off fluid



Fire protection valve is suitable for operating pressures to 150 psi

flow as temperatures build up, eliminating this hazard. Valve has a special bonnet equipped with a fusible link, causing it to close when temperature reaches 160°F.

Rotating double-disc assembly will maintain a tight seal even if body distorts due to heat. Valve springs are made of stainless steel to resist atmospheric corrosion. Valve itself is available in several different alloys.

(Fire protection valve is product of Cooper Alloy Corporation, Hillside, N. J.)

Check 2494 opposite last page.

Urethane insulation is easily handled and crushproof

Material resists chemicals and solvents

Uses: Insulation of pipe lines and fittings. Material is designed for service between −200°F to +250°F.

Features: Snap-on urethane

Snap-on urethane insulation is easily applied to piping of any size

insulation resists physical damage; it is easy to handle and quick to install. Based on Nacconate diisocyanates, insulation has excellent resistance to chemicals and solvents. Thermal conductivity 0.29 Btu/hr/sq ft/in., at 75°F. Density is 3.0 to 3.25 lb/cu ft.

(Urethane insulation is a product of National Aniline Div., Allied Chemical Corp., 47 West St., New York 6, N.Y.)

Check 2495 opposite last page.

Maintenance and Steam Traps

. . . there's a relationship that goes far beyond trap maintenance alone

Good traps and good trapping have a greater effect on your maintenance costs than does trap maintenance itself. By that we mean that the right traps, properly selected and installed, and with the benefits of a preventive maintenance program, will save far more maintenance dollars than they will cost.

Under the pressure of spiralling maintenance costs, this thought becomes mighty important. Let's take a look at what it involves:

Proper Selection of Steam Traps

1. Be sure it's the right type of trap.
2. Be sure it's sized right and is for the correct operating pressure.
3. Be sure it's first rate in design and construction.

Proper Installation of Steam Traps

1. Install them so they are accessible for inspection and maintenance.
2. Install a test valve.
3. Use a union or unions.
4. Use a shutoff valve or valves.
5. Use a strainer ahead of the trap if dirt conditions are bad.
6. Use a by-pass only where continuity of service is imperative.
7. Standardize inlet and outlet connections.

Preventive Maintenance Program

1. Test trap regularly for proper operation. (Trap size, operating pressure and importance determine frequency.)
2. Inspect internal mechanism at least once a year.

You Get Indirect Benefits As Well

The direct benefits of the plan outlined are pretty obvious — good traps, properly selected, require less maintenance . . . testing and inspection prevents troubles that lead to maintenance.

However, this plan provides indirect benefits which reduce maintenance in other parts of the plant as well:

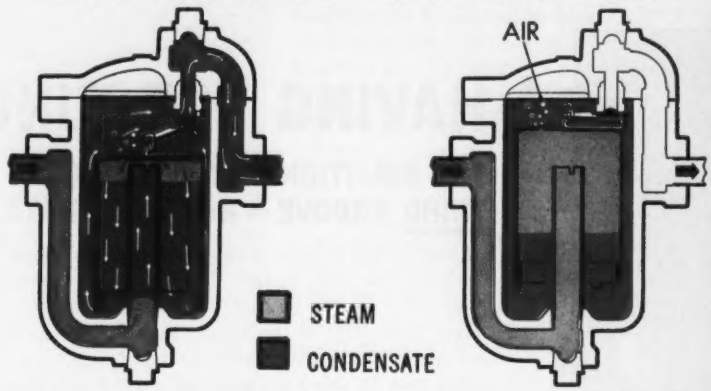
Good traps save steam and reduce the load (and consequently maintenance) on fuel handling and burning equipment and on ash handling equipment.

Good traps protect the system by eliminating water hammer and preventing the damage it can do.

Good traps discharge carbon dioxide before it can go into solution to form corrosive carbonic acid —less corrosion, less maintenance.

Good traps increase production to reduce the length of time equipment must operate or reduce the amount of equipment needed . . . either way maintenance is reduced.

HERE'S THE STEAM TRAP DESIGN THAT CAN REDUCE YOUR MAINTENANCE PROBLEMS



Trap open. Condensate entering trap has caused bucket to lose buoyancy. Weight of bucket times leverage pulls valve open. Air is discharged along with condensate.

Trap closed. Steam has floated inverted bucket; valve is held tightly closed by system pressure. Air entering trap passes through bucket vent and accumulates at top of trap.

How to Go About It (The Sales Pitch)

We admit we're prejudiced, but we don't think there is any better way to select steam traps than with the help of the 44 page Armstrong Steam Trap Book. Here in a single source is specific data on the selection and sizing of traps, how to install them for best results, and how to maintain them most economically.

The Steam Trap Book will also give you full information on the design and construction of Armstrong Inverted Bucket Steam Traps that offer these important maintenance-reducing advantages:

1. Armstrong Traps are dependable.
2. Armstrong Traps require no adjustments — go from full load to zero load automatically.
3. Armstrong Traps are self-scrubbing—ordinary dirt conditions can't hurt them.
4. Armstrong Traps have long-life parts — valve and seat are heat treated chrome steel — lever assembly and bucket are stainless steel.
5. Armstrong Traps have water sealed valves to minimize wire drawing and erosion.

Ask for your copy of the Steam Trap Book—there is no obligation. Then test Armstrong Trapping. If you are not completely satisfied with the results, you can return the traps for a full refund of the purchase price. You can't lose much that way. Call your local Armstrong Representative or Distributor, or write

Armstrong Machine Works
8802 Maple Street
Three Rivers, Michigan

ARMSTRONG STEAM TRAPS

Check 2496 opposite last page

ENGINEERING

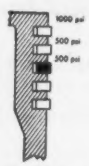
NEWS YOU CAN USE ABOUT ENGINE AND COMPRESSOR PERFORMANCE

← HAVING TOP RING TROUBLE?

THE SOLUTION MAY BE IN THE THIRD GROOVE—NOT THE FIRST!

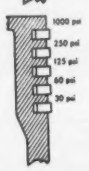
If you've had trouble with your top piston rings (excessive groove wear, groove damage, ring breakage, etc.) you won't need to be convinced that the top ring carries from 50 to 80% of the sealing load. Installing top rings of special, expensive materials is often not the answer. They may be shock-resistant but generally lack adequate wearing qualities. One likely solution is installation of a Cooktite sealing ring in the THIRD groove to relieve the load carried by the first ring. In an engine with a compression pressure of 500 psi and a firing pressure of 1000 psi, a Cooktite ring in the third groove will reduce the pressure differential on the top ring from a trouble-causing 750 psi to an easily-handled 500 psi. Ask a C. Lee Cook representative to explain in detail.

PRESSURE DIFFERENTIAL AT FULL FIRING PRESSURE



WITH COOKTITE SEALING RING IN THIRD GROOVE

500 psi



WITHOUT COOKTITE RING IN THIRD GROOVE

750 psi

MACHINED ROUND SHAPES FROM ANY MATERIAL

MADE TO YOUR BLUEPRINTS

Any machined round shape that can be produced by turning, milling, rolling, lapping or drilling can be made to your blueprints by C. Lee Cook Company. Any size from 1" to 60", with finishes down to 4 micro-inches and tolerances as close as .0002". And, there's almost no limit to the materials that can be machined. Send your blueprints for quotation or contact us for engineering recommendations. *Airtomic Products Division,* C. Lee Cook Company, Louisville 3, Ky.

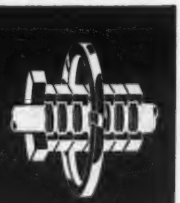
WRITE FOR COOK'S NEW PISTON RING CATALOG

Sixteen-page catalog just off the press. Describes complete line of piston rings manufactured by C. Lee Cook Company, also the special rings of the Airtomics Division. For your free copy, write: C. Lee Cook Company, 932 South 8th Street, Louisville 3, Kentucky.

C. LEE COOK COMPANY

Division of Dover Corporation

Rings and Packings Since 1888



Check 2497 opposite last page

Non-spark covering resilient and tough, easily applied

Material resists solvents, oils, and most chemicals

Uses: As a non-slip, non-sparking floor covering or surfacing on ladders, walkways, platforms, stairs, or floors.

Features: Long-wearing, resilient surface resists most chemicals, oils, and solvents, and provides a complete moisture barrier. Pressure-sensitive adhesive backing makes application quick and easy.

Description: Covering has a textured bonded-particle surface. Backing is a dimensionally stable plastic film with a waterproof, pressure-sensitive adhesive protected by a backliner. Material weighs 2½ oz/sq ft with an overall thickness of 45-50 mils.

Floor covering is available in gray, beige, and black in standard 96' rolls 4" to 36" wide; in ¾" x 24" strips; and in 9" x 9" tiles. Custom shapes can be made to order.

(Scotch-Tred floor covering is a product of Minnesota Mining and Manufacturing Co., 900 Bush St., St. Paul, Minn.)

Check 2498 opposite last page.

Positive seal obtained in conduit connectors without O-rings

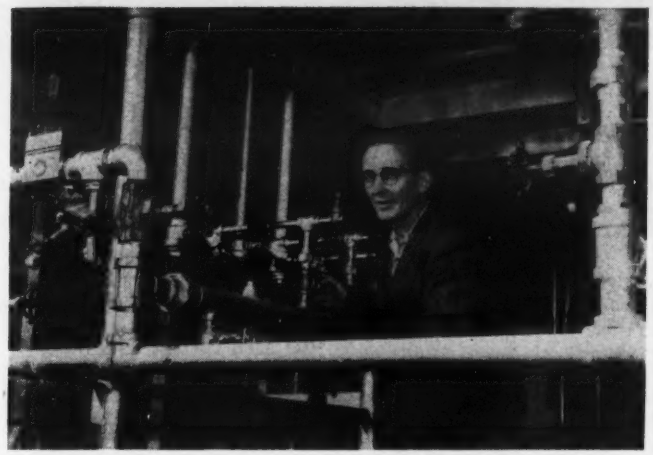
Uses: Connecting conduit to wiring boxes.

Features: Insulated throat-wedge adapter in conduit connector provides a positive, liquid-tight, cold-weld seal with positive ground. There are no gaskets to deteriorate.

Description: Connectors consist of a compression nut, brass ferrule, connector body, and insulated throat-wedge adapter. Installation is quick and easy. A positive seal against liquids, fumes, or foreign matter is formed.

(STN series connectors are available from Appleton Electric Co., 1701 Wellington Ave., Chicago 13, Illinois.)

Check 2499 opposite last page.



H. K. Pedersen, plant engineer, checks valves on heating coils for dry-milk-solids dryer. Brinalloy seats and discs have eliminated frequent shut downs

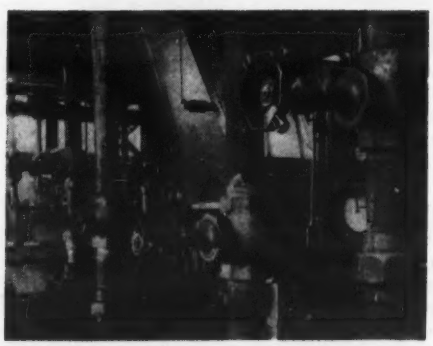
In face of growing maintenance costs on general service valves, Sheffield Chemical launched a program of testing that bore fruit as . . .

Valves cut maintenance, halt shutdowns

Problem: Valves on steam and hot water throttling service were an excessively high maintenance item at Sheffield Chemical, Div. of National Dairy Products Corp., Norwich, New York. Common sources of failure were wire-drawing and scoring of seats, trim and body erosion, and general failure to shut off after short period of service.

Company is a bulk producer of pharmaceuticals, chemicals, and food products from non-fat milk and from milk solids.

Sheffield Chemical has a high demand for process steam and a large number of separate steam uses. For example, process evaporators must drive off an average of 91.3% water from non-fat milk to produce dried milk solids. When this equipment was shut down to replace a valve, loss of production was far more costly than the price of valve and labor to install it. A valve that would keep various op-



Valves controlling steam to boiler feedwater pumps. Trials in this service prompted a general valve replacement program

pumping something special?	check these special features available with Yeomans Vertical Wet Pit Centrifugal Pumps*
sand, glass particles and other abrasives	*Lubri-Vac*® reduces by 95% the failure of bearings due to scoring by abrasive particles. Lubri-Vac constantly flushes bearings with lubricant, keeps foreign matter away. (An exclusive Yeomans feature included on all heavy-duty pumps.)
ash, fly ash, cinders, bits of coal, corn foots and other solids contained in drainage	A cradle pump with protective sleeves to protect shaft. Special manganese steel parts. Yeomans pumps including these features will give long life under the most severe abrasive conditions.
potassium cyanide, sulphuric acid, jet fuel, melted naphthalene and other toxic or volatile liquids	Shaft seal is not under liquid pressure with Yeomans Vertical Wet Pit Pumps. This feature eliminates the leakage hazard which is present with horizontal pumps.
molten phosphorous, acetic acid, hydrochloric acid, black liquor and other corrosive liquids	Whatever the corrosive and/or abrasive liquid to be pumped—Yeomans has special ferrous and non-ferrous alloy parts to handle it.

*Vertical Wet Pit Centrifugal Pumps save floor space, require no priming —no costly liquid leaks as stuffing boxes are not under liquid pressure. Capacity range from 5 g.p.m. to 10,000 g.p.m.

YEOMANS

2003-5 NORTH RUBY STREET, MELROSE PARK, ILLINOIS

☐ Please send me the catalog, "Yeomans Heavy-Duty Wet Pit Pumps."

☐ I wish to know how I may see Yeomans' 15 minute film on Wet Pit Pumps.

Name_____

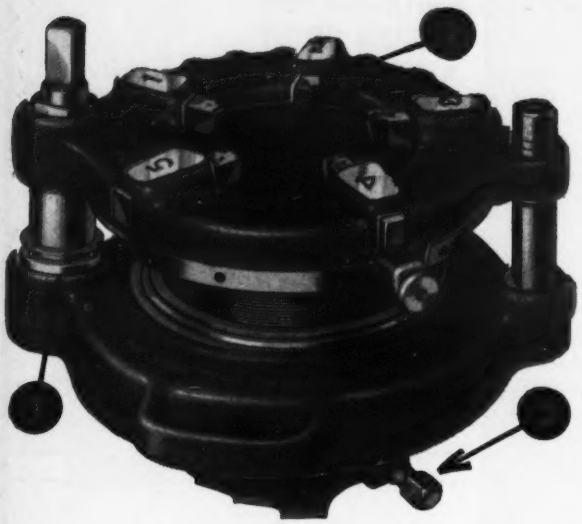
Company_____

Street_____

City_____ Zone_____ State_____

Check 2500 opposite last page

Now you thread 4", 4½", 5" and 6" pipe with only One set of dies with the New RIDGID No. 161 4" to 6" Geared Pipe Threader



Check These Time-Saving Features:

1. **Jam-Proof** for safe threading by power or hand. Drive pinion kicks out automatically when full thread is cut. Die head can't jam.
2. **Only 1 Set of High Speed Dies** threads 4", 4½", 5" and 6" pipe. 2 quick release knobs for fast size settings. Adjustable for tapered or straight, over or under size threads.
3. **Plate Type Workholder** sets to size *before* putting on pipe. Just one screw to tighten—no bushings.

What's more the new No. 161 has all the time-saving and proved performance features that have made the RIDGID 65R-TC and 4PJ Threaders the world's most popular. Save time on your large pipe jobs . . . order the 161 from your Supply House today!

The Ridge Tool Company, Elyria, Ohio, U.S.A.

Check 2501 opposite last page

erations "on stream" continuously was imperative.

Solution: After a number of unsuccessful plant trials with various valves, engineers located a bronze globe valve with seats and discs of a wear-resistant alloy, Brinalloy. This alloy has more resistance to wear and wire-drawing than 500 Brinell stainless steel.

Contact surfaces are lapped to a mirror-smooth finish, and seat and disc are silver-brazed into body and disc holder. Despite flat seating, valve does not trap solids in closing. Foreign material that lodges momentarily is crushed between seating surfaces, and line fluid sweeps through until metal meets metal to effect a bottle-tight seal.

One of the first installations was on steam control to a boiler feedwater pump. As a result of performance in this service a program was started early in 1956 in which an existing valve, when it showed signs of failure, was replaced.

Results: Replacement program resulted in reduced maintenance and achieved an uninterrupted plant operating schedule. Valves are easy to operate, give good flow regulation, and never fail to give tight shut off.

(LQ 600 valves are product of The Lunkenheimer Company, Beekman, Waverly, and Tremont Streets, Cincinnati 14, Ohio.)

Check 2502 opposite last page.

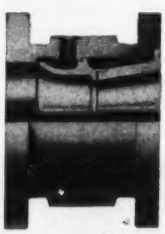
Rapid steam generation obtained by boiler's multi-pass design

Uses: Low- or high-pressure hot water or steam generation in capacities to 100 hp.

Features: Water-tube construction coupled with multi-pass design assures rapid steam or hot water generation. Thermal efficiency is guaranteed at 81%.

Description: Forced-draft, water-tube packaged boilers are fully automatic, either gas or oil fired. Full access is provided to both the fireside and waterside of all tubes without

Highest efficiency in the shortest laying length—less weight—easier to handle and install and low cost. Laying length is identical for each line size regardless of throat area ratio. Based on modern hydro-dynamic principles, the new "TWIN-THROAT" Venturi produces a higher differential pressure for a given throat than is possible with ordinary types—without increasing the head loss.



The "TWIN-THROAT" Venturi can be utilized for metering water, sewage, air and other fluids and gases. It is available in a full range of sizes from 4" through 48". Standard construction is grey iron with bronze inserts. Also available in cast steel and alloys. Brochure giving technical data, complete with performance graphs, dimensional data, etc., will be sent free upon request. Write today for Bulletin 1021.

58531 INFILCO

Infilco Inc., General Offices: Tucson, Ariz., P.O. Box 5033
Field Offices throughout the U.S. and in foreign countries

THE ONLY COMPANY impartially offering equipment for ALL types of water and waste processing—coagulation, precipitation, sedimentation, flotation, filtration, ion exchange and biological treatment.

Check 2503 opposite last page

dismantling the boiler. Sweeping action of hot gases over outer surface of water tubes makes boiler virtually self cleaning. Forced-draft burner eliminates the need for elaborate controls.

(Compak packaged boilers are a product of International Boiler Works Company, 954 Plum Street, East Stroudsburg, Pennsylvania.)

Check 2504 opposite last page.

Unit-wrapped items speed recognition in first-aid kits

Facsimile index on case lid shows location of all items

Uses: Kits are designed to facilitate emergency treatment.

Features: Unit-wrapped items, boldly labeled and arranged for immediate recognition and access, speed first aid treatment. Facsimile index on inside of case lid shows at a glance exact location of all items and gives concise instructions for their use. Index also serves as a positive inventory control, since any missing items can be quickly identified from facsimile table.

Description: Heavy-duty, first-aid kits are available in sizes of 10, 16, 24, and 36 units, with standard assortments of first aid items or with "custom" assortments to meet special requirements. Cases are 20-gage steel, finished in either olive green or grey baked-on enamel. Lids are fitted with a rubber gasket to keep out dust and dampness. Integral mounting brackets and carrying handle permit kits to be used for permanent wall installation or portable service.

(G-S Unit-type first-aid kits are supplied by General Scientific Equipment Co., PO Box 3038, Philadelphia 50, Pa.)

Check 2505 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

The Yarway Impulse* steam trap is the only steam trap that continually senses condensate conditions in the line ahead of the trap, and discharges this condensate as soon as it forms.

Result—higher temperatures, steadier temperatures, peak operation of steam heated equipment at all times.

* A COMPLETE LINE OF STEAM TRAPS, ALL OPERATING ON A PROVEN THERMODYNAMIC PRINCIPLE

Actual size, ¾" trap

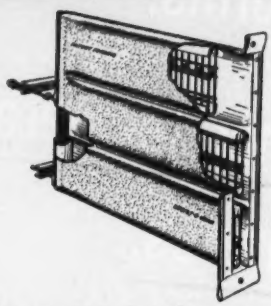
YARWAY impulse®

Manufactured by YARNALL-WARING CO., 127 Mermaid Avenue, Philadelphia 18, Pa.
Stocked and sold by 270 Industrial Distributors.
Write for free bulletin "The Why and How of Steam Trapping."

Check 2506 opposite last page

NEW "ROLLER CLEANER" provides greatly simplified method of cleaning dust from filter bags. Resilient rubber rolls automatically adjust to form a positive dust seal as each row of bags is cleaned by atmospheric air.

Now with the NEW SLY "ROLL-CLEAN" DYNACLONE



As much as 3 TIMES LONGER BAG LIFE

NEW SLY "RESIST-O-WEAR" FILTER BAGS (patent pending) provide complete dust filtration with as much as three times longer life than conventional bags. This has been proved on the toughest field installations.

The new bag has three equal-size sections. Each pocket has two spacers, making a total of six per bag. Weight is distributed on three seams rather than one, minimizing strain. A special protective flap on the back end prevents abrasion from incoming dust.

Now standard in the new "Roll-Clean" Dynaclone, Sly "Resist-O-Wear" bags combine with all the other superior Dynaclone features to assure greatest dust collecting efficiency with unequalled maintenance-free service.

ALL THESE FEATURES IN ONE DUST FILTER

- New "Resist-O-Wear" bags last as much as three times longer.
- Free-rolling cleaner. Complete dust seal—automatic seal adjustment.
- Constant suction at dust sources—complete dust collection.
- Greater filtering capacity; smaller space requirements.
- Automatically self-cleaning for continuous operation.
- Simplified construction for ease of inspection and servicing.

SEND FOR New Bulletin 105 and New 36-page Dust Control Catalog 104.

SINCE 1870 SLY

THE W. W. SLY MANUFACTURING CO.

4754 TRAIN AVENUE • CLEVELAND 1, OHIO
OFFICES IN PRINCIPAL CITIES

Check 2507 opposite last page

Taylor-Stiles solves YOUR CUTTING PROBLEM...

Whether it be Plastics Pelletizing, Cutting Reclaimed Rubber, Horse-Mane, Bagasse, or other products.

No matter what your cutting problem, whether your material be hard, yielding, or slippery, Taylor-Stiles can offer a machine that will meet your exact needs.

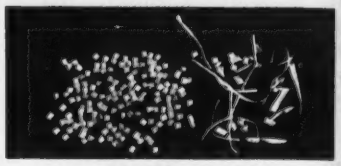
You will find Taylor-Stiles cutters are highly efficient. The shear cutting principle on which they operate assures a clean cut, high production and—in most cases—lower power costs.

These machines have a revolving head with two or more fly knives cutting against one or more fixed knives.

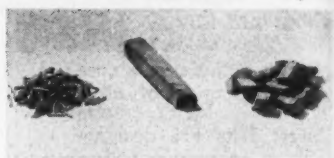
Taylor-Stiles cutters are being used today by leading concerns in such fields as plastic pelletizing, rag cutting, thread waste cutting, cutting rubber into strips or pellets, shredding paper and scores of other uses.

You don't have to suffer low production, poor cutting, high power and excessive knife costs by using outmoded cutting methods.

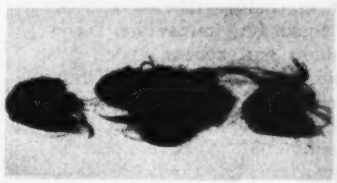
To solve your cutting problem write us today stating the material to be cut and we will send you at once a copy of our descriptive folder relating to the cutting of your product.



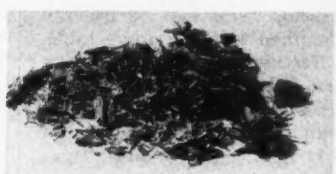
Plastics



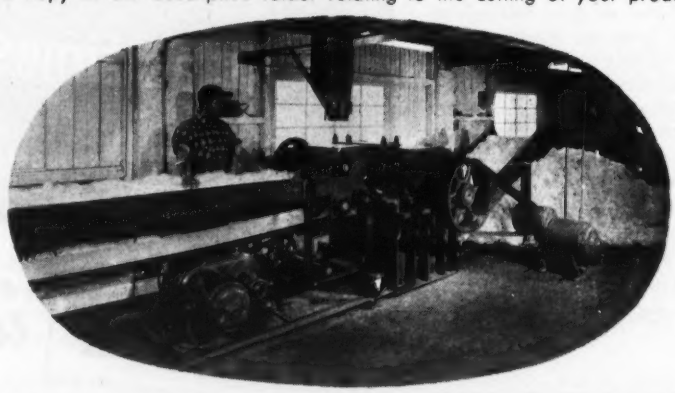
Reclaimed Rubber



Horse-Mane



Bagasse



TAYLOR, STILES & COMPANY
20 BRIDGE STREET • RIEGELSVILLE, NEW JERSEY

Check 2508 opposite last page

Operator safety assured in plants by phosgene detector crayons

Were developed by Army Chemical Corps

Phosgene detector crayons, which change color in the presence of phosgene vapors, have been found extremely useful in maintaining operator safety in a number of chemical processing plants. For tests, crayon mark is made on any suitable surface such as a piece of paper, wood, or hood wall.

Development of the detector crayons by the Army Chemical Corps is one of the many examples of how products made for military applications are found to be extremely useful in industry.

One large plastics company reports that the detector crayons have been found to be the only practical, specific detecting device for phosgene that company has found. It is felt that use of the crayons contributes to the morale of operators working with the gas in this plant. Several leaks have been detected, but no operator was exposed to a dangerous concentration.

At another plant making organic chemicals, crayons have been found quite useful for detecting phosgene in liquids in drums. Free space in drum is checked for phosgene by holding a strip of paper with crayon mark on it in bung opening.

At a third plant, they are used for detecting leaks in phosgene cylinders and in reaction systems into which the gas is being introduced. They also have utility in testing for completeness of a degassing operation, for example, when phosgene or HCN is used.

Two types of phosgene detector crayons are available, one for traces of phosgene and one for higher concentrations. Hydrogen cyanide detector crayons can also be obtained.

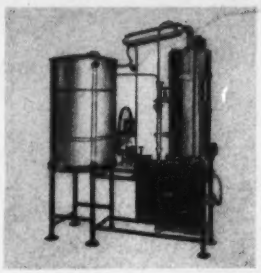
(Detector crayons are manufactured by Aromil Chemical Co., Div. of Synorganics Inc., 5646 Belle Ave., Baltimore 7, Maryland.)

Check 2509 opposite last page.

BARNSTEAD

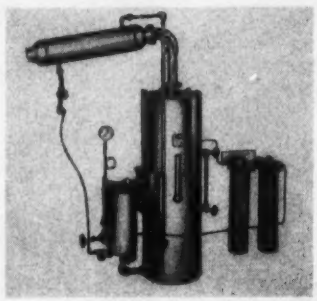
PURE WATER SPECIALISTS SINCE 1878

WATER STILLS and DEMINERALIZERS



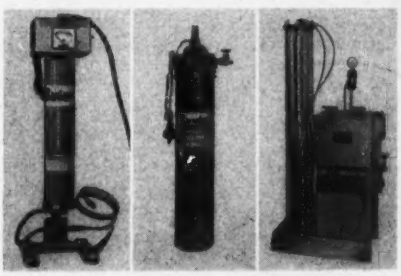
PUREST WATER AUTOMATICALLY

Barnstead Full Automatic Controls for water stills are self-starting . . . self-flushing . . . self-stopping. No human attention needed. Automatically guarantees a steady supply of distilled water of highest purity.



THE STILL YOU NEVER NEED CLEAN

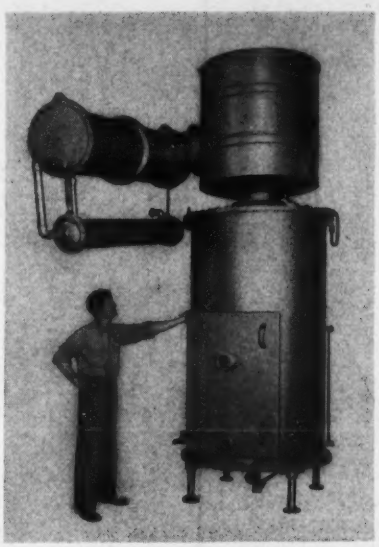
The NEW Barnstead Condensate Feedback Purifier for Barnstead Steam Heated Stills offers two important advantages. Produces distilled water of higher purity than ever before, and completely eliminates need for cleaning Still.



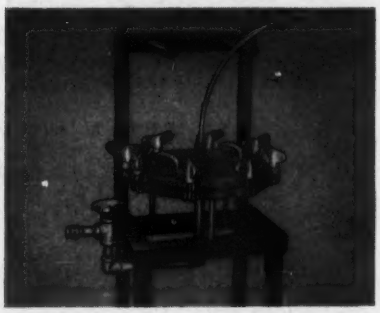
BANTAM DEMINERALIZER (BD-1) Connects directly to water supply. Disposable resin cartridge. Flow rate: 5 to 10 g.p.h.

PRESSURE BANTAM DEMINERALIZER (BD-2) Delivers demineralized water under pressure. 5 to 25 g.p.h. Pura-lite indicates cartridge change.

MIXED-BED DEMINERALIZERS (MM) in capacities ranging from 50 to 2500 g.p.h. Efficient and low cost in operation. Exceptionally high purity.

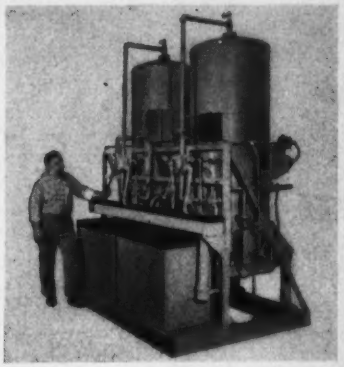


FOR PHARMACEUTICAL MANUFACTURERS. 300 G.P.H. PYROGEN-FREE WATER PRODUCED BY THIS MODEL SSQ-300 BARNSTEAD WATER STILL



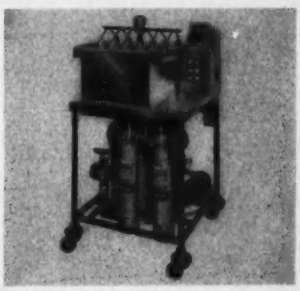
BARNSTEAD "MF" SUBMICRON FILTER FOR REMOVAL OF PARTICLES TO 0.45 MICRON

For either distilled or demineralized water . . . removes particulate matter which may cause trouble in some of the new processes in electronic and nuclear fields. Filters out particles as small as .000016 inches. Produces 15,000,000 ohm water in production quantities.



DEMINERALIZED WATER AT FLOW RATE OF 2500 G.P.H.

is produced by this Barnstead Model TM-6, Two-Bed Demineralizer. Complete package unit, factory assembled, ready to connect to raw water supply. Also Mixed-Bed, Single-Bed, Two-Bed, and Four-Bed Models. Write for catalog 127-A.



BARNSTEAD TRANSISTOR WASHER FOR WASHING TRANSISTORS, DIODES, RECTIFIERS, TUBE PARTS IN ULTRA PURE 15,000,000 OHM WATER

Faster rinsing and fewer rejects when hot, ultra-pure water is used in rinsing of electrical components. Barnstead Transistor Washer conserves thousands of gallons each day . . . as it repurifies the pure, hot water keeping it free of organic impurities and submicroscopic particles to 0.45 micron. Write for Bulletin #146.

BOSTON JAmaica 4-3100
CHICAGO MUlberry 5-8100
CLEVELAND ACademy 6-6822

Barnstead STILL & STERILIZER CO. Inc.

JOHNSON CITY 3113
SAN FRANCISCO TEmplebar 2-5301
CHATTANOOGA 6-5863

NEW YORK Kingsbridge 8-1557
PHILADELPHIA LOcust 8-1796
LOS ANGELES RYan 1-6663

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

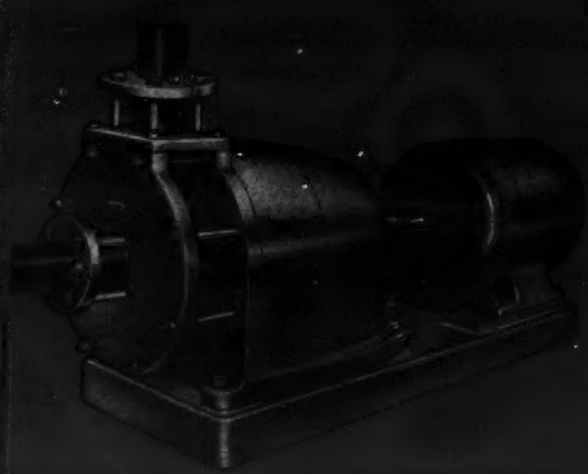
FIRST IN PURE WATER SINCE 1878

Check 2510 opposite last page

. . . the almost perfect

CHEMICAL PUMP

another development by FALLS INDUSTRIES



The secret is in the seal . . . a self-cooling, self-lubricating carbon-to-carbon rotary seal capable of withstanding temperatures in the 500°F. range. This seal requires no special lubrication, or externally located cooling apparatus which might be contaminated by product leakage. Seal is virtually leak-proof when kept in normal adjustment, and is not attacked by most corrosives.

One user says, "Pump operating continuously for 6 months on 75°C. chlorinated organic acid. Best service ever; no maintenance yet." Another states, "During 3 months, total labor and maintenance has been $23.00 for 14 Impervite pumps handling hot mixtures of phenol, chlorobenzene, benzene and hot muriatic."

. . . and Impervite pumps are surprisingly low in cost.

Impervite pumps are single stage centrifugals, available in 6 standard models from 25 to 300 gpm at 20 to 100 foot heads. Corrosives come into contact only with Impervite impervious graphite, which is unaffected by all corrosives except a few highly oxidizing agents, is immune to thermal shock, and non-contaminating. Bulletin available on request.

SEE OUR CATALOG IN C.E.C.

FALLS INDUSTRIES, INC

AURORA ROAD • SOLON, OHIO

Phone: CHurchill 8-4343 • Teletype No. Solon

TUBE AND SHELL EXCHANGERS incorporating latest designs and standards . . . Bull. 448.

CASCADE COOLERS full range of sizes covered for volume cooling applications . . . Bull. 537.

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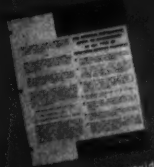
PIPE, FITTINGS AND VALVES . . . Bull. 965-1.

PLATE AND BAYONET HEATERS . . . full line for tank heating requirements . . . Bull. 753-2.

RUPTURE DISKS made of impervious graphite display some truly amazing properties which save money for processors . . . Bull. 315.

COSTS AND STANDARDS of impervious graphite processing equipment . . . Bull. 249.



FIELD SERVICE provides trained men for installation, re-location or repair of any impervious graphite equipment . . . Bull. 24.

CENTRIFUGAL PUMPS Bull. 854-1.

CUBICAL exchangers require only ½th the area as comparable capacity tube and shell design . . . Bull. 182.

FALLS INDUSTRIES, INC.
31909 Aurora Rd., Solon, Ohio

SEND THE FOLLOWING LITERATURE:

- ☐ Bulletin No. 448
- ☐ Bulletin No. 965-1
- ☐ Bulletin No. 537-A
- ☐ Bulletin No. 854-1
- ☐ Bulletin No. 753-2
- ☐ Bulletin No. 315
- ☐ Bulletin No. 249
- ☐ Bulletin No. 24
- ☐ Bulletin No. 537
- ☐ Bulletin No. 505

NAME .....

TITLE .....

COMPANY .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

12-12

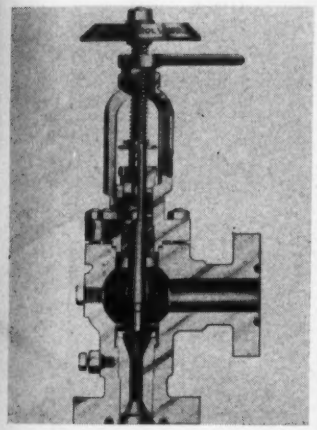
Accurate fluid control given by valve with opening indicator

Stem locks at any setting

Uses: High-pressure throttling control of fluid flow in pressure ratings to 10,000 psi.

Features: A pointer and calibration plate indicate amount of orifice opening in valve. This metering feature makes unit ideal for accurate fluid or gas control. Stem may be locked at any setting.

Description: Metering valve is available in ASA or API flanged or threaded connections in carbon steel, stainless steel, bronze or aluminum. It is manufactured in sizes 1" to 6". Tapered throat gives a Venturi effect with excellent flow characteristics.



Pointer indicates amount of orifice opening in high-pressure throttling valve

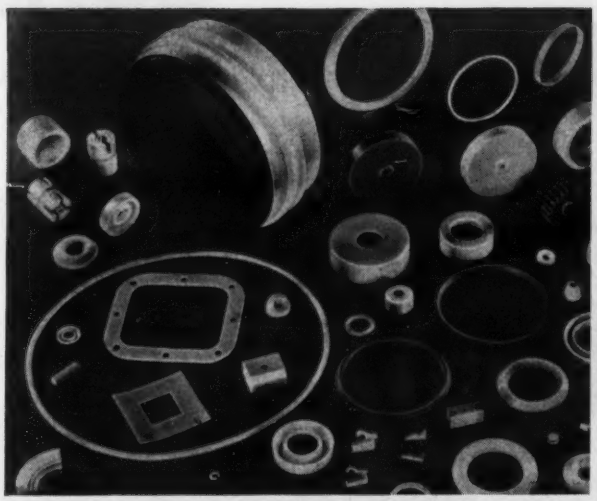
Several interchangeable tips can be provided: conical, micro tip (equal changes of orifice area for equal stem travel); thermo tip (internal heating element); and extra-hard metal tips for special abrasion resistance.

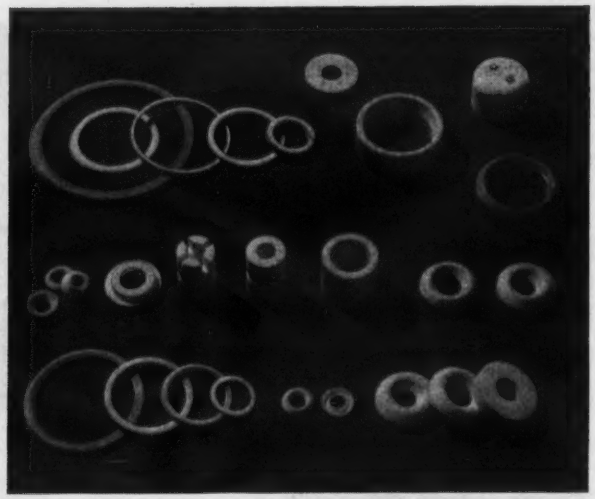
(Metering valve is a product of Shaffer Tool Works, 209 S. Pomona, Brea, Calif.)

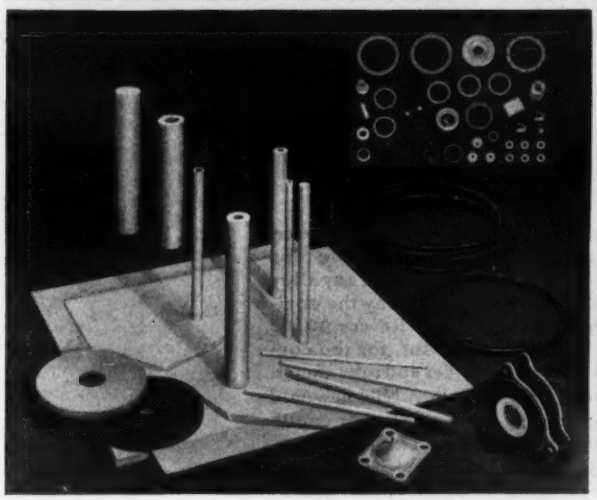
Check 2511 opposite last page.

For more information on product at left, specify 2512 . . . see information request blank opposite last page.

R/M is your best single source for TEFLON* in any form







Pioneering in the fabrication of "Teflon," R/M has built a solid record of achievement in utilizing the unique properties of this material. Our engineers have done many things previously considered impossible, such as molding very complex valve diaphragms.

In addition to the knowledge and skill of its personnel, R/M has the production facilities to produce "Teflon" in *any* form and quantity you require. Make us your prime source for every "Teflon" product, from sheets, rods, tubes, tape and flexible wire braid covered hose to the most intricate molded and machined components.

No matter how exacting your specifications, depend on R/M to meet them with complete satisfaction. Your nearby R/M district office will be glad to give you the cooperation you need when your project is in the design stage. Or write for free literature and detailed information.

*A Du Pont trademark

R/M

RAYBESTOS-MANHATTAN, INC.

PLASTIC PRODUCTS DIVISION FACTORIES: MANHEIM, PA.; PARAMOUNT, CALIF.

Contact your nearest R/M district office listed below for more information or write to Plastic Products Division, Raybestos-Manhattan, Inc., Manheim, Pa.

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RAYBESTOS-MANHATTAN, INC., Engineered Plastics • Asbestos Textiles • Mechanical Packings • Industrial Rubber • Sintered Metal Products • Rubber Covered Equipment
Abrasive and Diamond Wheels • Brake Linings • Brake Blocks • Clutch Facings • Laundry Pads and Covers • Industrial Adhesives • Bowling Balls

Check 2513 opposite last page

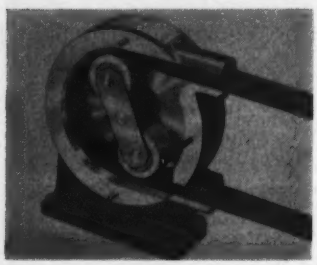
Tubing changes speeded in squeeze pump

Unit handles corrosive, abrasives to 246 gph

Uses: Pumping corrosive, sterile, or abrasive solutions.

Features: Design change in the Squee-Gee pump speeds tubing changes and eliminates drip. Pump will handle corrosive, sterile, or abrasive solutions virtually without maintenance. Capacity has been increased to 246 gph.

Description: A single, continuous, flexible tube provides



Pump is designed to transfer hard-to-handle solutions

both inlet and outlet for pump which completely isolates fluid from all moving parts. Solutions are squeezed through tube by a double-end, ball-bearing rotor. By threading from the side, changing of tubing is made more quickly and chances of dripping are eliminated.

(Squee-Gee pump model 610 is a product of The Randolph Co., 1018 Rosin St., Houston, Texas.)

Check 2514 opposite last page.

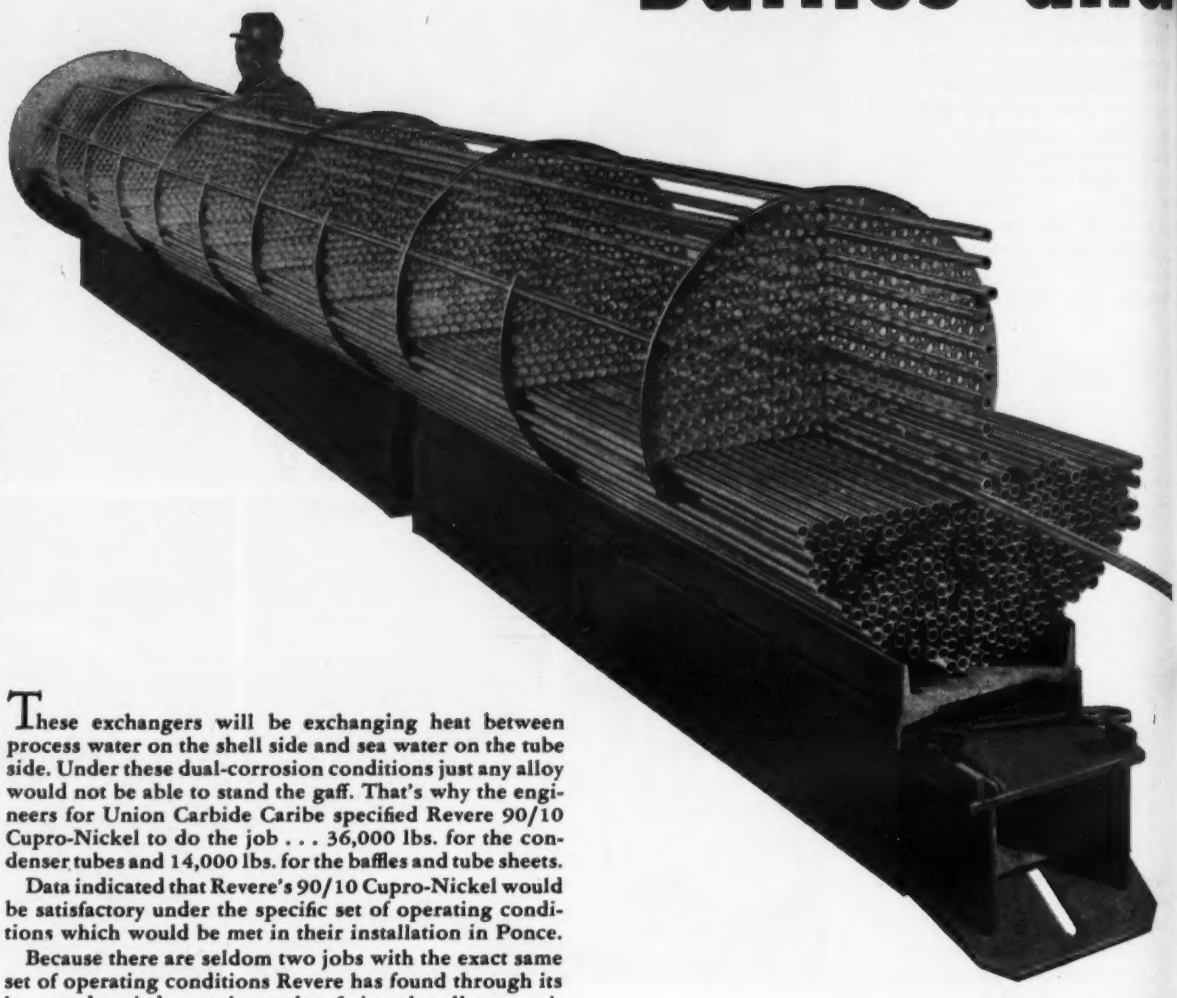
Sight glass gives view of condensate flow in expansion joint

Uses: Expansion joint and piping compensator absorbs normal expansion of steam lines.

Features: Unit can be obtained with a sight glass that permits viewing of conditions within condensate lines. They can be used to handle misalignment as well as axial expansion.

Description: Expansion joint

Revere 90/10 Cupro-N Baffles and T



These exchangers will be exchanging heat between process water on the shell side and sea water on the tube side. Under these dual-corrosion conditions just any alloy would not be able to stand the gaff. That's why the engineers for Union Carbide Caribe specified Revere 90/10 Cupro-Nickel to do the job . . . 36,000 lbs. for the condenser tubes and 14,000 lbs. for the baffles and tube sheets.

Data indicated that Revere's 90/10 Cupro-Nickel would be satisfactory under the specific set of operating conditions which would be met in their installation in Ponce.

Because there are seldom two jobs with the exact same set of operating conditions Revere has found through its long and varied experience that fitting the alloy to suit the job is the best way to extend tube life to the maximum.

To find the alloy or combination of alloys best suited to meet a specific set of operating conditions, Revere offers the help of its Research Department, made available through the Technical Advisory Service.

Revere makes tubes and tube sheets in all the customary as well as special alloys. See the nearest Sales Office.

ONE OF THE 4 heat exchanger bundles which collectively accounted for 50,000 lbs. of Revere 90/10 Cupro-Nickel in the form of tubes, baffles and sheets.

COPPER • BRASS • 1801 • REVERE • ALUMINUM

REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

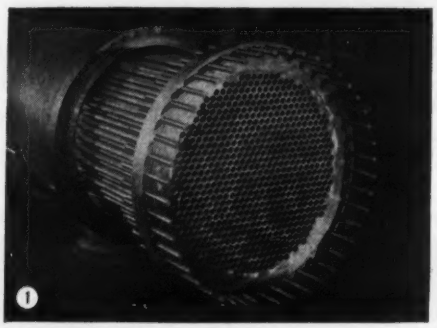
230 Park Avenue, New York 17, N. Y.

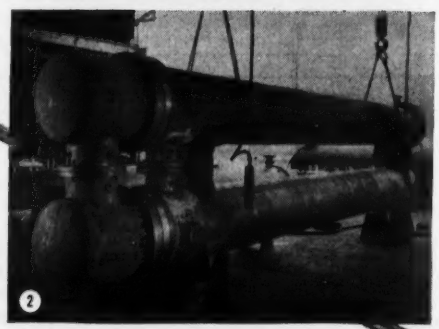
Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calhoun, Neb. Sales Offices in Principal Cities, Distributors Everywhere.

Nickel Condenser Tubes, Tube Sheets

Fabricated into Heat Exchangers by ENGINEERS and FABRICATORS, INC.

to be used in the Union Carbide Caribe's chemical plant in Ponce, Puerto Rico under tough, dual-corrosion conditions





(1) CLOSE-UP of one of the bundles that has been completely tubed and is ready for bolting into the shell.

(2) COMPLETED UNITS with channel heads in place and completely stacked ready for shipment to the Union Carbide Caribe Incorporated chemical plant in Ponce, Puerto Rico.

(3) HERE YOU SEE a section of the shop of ENGINEERS and FABRICATORS, INC., Houston, Texas, where the 4 heat exchangers were made.

Check 2515 opposite last page

can be turned 360° to take care of piping torque strains as well as placing sight glass in its most advantageous position. Units have all-steel, crack-free chrome plated casings. Ball seats are sealed with Teflon wedge seals spring seated with stainless steel springs. Internal sleeve is stainless. Sleeve permits ball nipple to flex about 10% on each end to compensate for piping strains and misalignment.

(Expansion joint and piping compensator is a product of Rotherm Engineering Co., 7280 West Devon Ave., Chicago 31, Illinois.)

Check 2516 opposite last page.

Three-way plug valve: leakproof shutoff, low pressure drop

Uses: Control of flow of either gas or liquid.

Features: Design of valve provides leakproof shutoff and prevents external and body leakage. Pressure drop is held to a minimum.

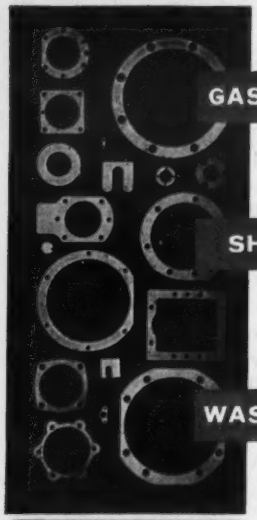
Description: Three-way plug valve provides one inlet, one outlet and an exhaust either piped or to atmosphere. When functioning as a selector valve unit has one inlet and two outlets or two inlets and one outlet. Operating temperatures are −40 to 250°F and operating pressures are −14.7 to 150 psi.

Three-way plug valve has O-ring seal for leakproof shutoff

(Series 9300 plug valves are product of Circle Seal Products Co., 2181 East Foothill Boulevard, Pasadena, Calif.)

Check 2517 opposite last page.

No Order TOO SMALL... or TOO BIG!



With more than 50 years' accumulation of dies, chances are we can furnish the gaskets, shims, or washers you need *. . . without a die charge.* This can cut your cost and speed delivery—whether you need just a few items or large quantities. Gaskets, shims, washers or special stampings are available in metallic, non-metallic and plastics to meet your production requirements.

NOW...WIL-PAK PLASTIC SHIM STOCK with thickness identified by color and gauge number. Write for Bulletin No. 570.

Write for Catalog and prices

CHICAGO-WILCOX Mfg. Co.
7717 South Avalon Avenue
Chicago 19, Illinois

Check 2518 opposite last page

PROTECT YOUR HANDS!

SILA-HAND . . . THE NEW PROTECTIVE INDUSTRIAL HAND CREAM, REALLY WORKS!

Your hands are constantly exposed to the injurious, harsh and damaging effects of solvents, acids and alkalies — protect them with SILA-HAND.

The high percentage of silicone in SILA-HAND forms a protective coating against the action of these chemicals. SILA-HAND eliminates the damaging effects to your hands and helps keep dirt and grime from penetrating the pores of your skin.

SILA-HAND also contains lanolin to help replace the natural body oils that have been dehydrated from the hands.

Don't put up with sore, rough and dried-out hands another day . . . order a supply of SILA-HAND today! Use the coupon below for fast service.

WARCO LABORATORIES
13609 So. Normandie Ave., Gardena, Calif.

Please send _____ jars of SILA-HAND at $1.75 per jar plus tax and postage to:

NAME _____

COMPANY _____

ADDRESS _____

Check 2519 opposite last page

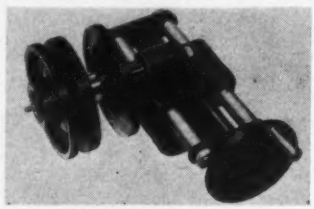
ENGINEERING & SAFETY

For wide speed range use variable-speed, small pulley

For use with ½ or 1 hp constant speed motors

Uses: To provide variable-speed drive from small constant-speed motors.

Features: Unit permits an extremely wide range of speeds to be obtained. Just a few inches of adjustment make complete speed range available.



Variable-speed pulley adjusts quickly through wide speed range

Description: High-ratio pulley is supplied in two models, one for fractional to ½ hp, the other for fractional to 1 hp. Pulley is a double, variable-pitch unit which automatically adjusts driver and driven sheave belt speeds. Faces of pulley are plastic. Assembly is needle-bearing mounted on a hardened countershaft. Simple handwheel adjustment gives precise settings.

(High-ratio pulley is a product of Lovejoy Flexible Coupling Co., 4949-H W. Lake St., Chicago 44, Ill.)

Check 2520 opposite last page.

This foamed insulation of polystyrene made self-extinguishing

Uses: For insulation of low-temperature equipment and various building applications.

Features: This foamed insulation contains an ingredient to make polystyrene product completely self-extinguishing. Manufacturing process assures uniform distribution of additive without lessening overall thermal efficiency.

Description: Material is a

CUT PLANT MAINTENANCE COSTS WITH

KERPON Protective Coatings

KERPON PROTECTIVE COATINGS

Phenolic, Epoxy, Latex Resins—All Type Applications!

MINIMIZES CORROSION in Tanks—Vats—Pipes—all Containers, any Exposed Metal

PROTECTS AGAINST highly concentrated Acids—Fumes—Caustics—Alkalies—Abrasives—Heat

PROVEN SUPERIOR in Resistance—Flexibility—Long Life—Reduction of Deterioration Under the Most Extreme Corrosive Conditions

KERPON PROTECTIVE COATINGS
Faster to Apply—Cost Less

For an Easy Solution to Your Corrosion Problems— write

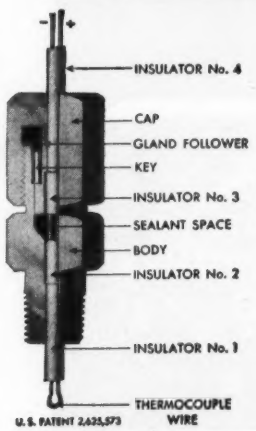
KERR CHEMICALS, INC.
Box 89 • PARK RIDGE, ILL.

Check 2521 opposite last page

Fast Response

conax®

BARE WIRE THERMOCOUPLE GLANDS



provide the only simple, positive method for sealing two or more bare wires at pressures from full vacuum to 20,000 psi.

Low mass, unshielded, bare wire thermocouples give almost instantaneous response to temperature changes assuring greater accuracy of measurement and control.

- **Temperature range—−300°F to +1850°F**
- **All stainless steel construction**
- **Complete range of sizes**
- **Available from stock**

WRITE FOR CONAX DATA BOOK SHOWING COMPLETE LINE OF THERMOCOUPLE ASSEMBLIES AND PRESSURE SEALING GLANDS.

conax corporation
2314 Walden Ave., Buffalo 25, New York

Check 2522 opposite last page

polystyrene foam called SE Armalite. It has a density of 1.25 lb/cu ft. Insulation has a "k" factor of 0.24 at 60°F mean temperature. It is made in standard board sizes ranging in length from 3′ to 15′ and in width from 12″ to 36″. Standard thicknesses are 1, 1½, 2, 3, 4, and 6″.

(SE Armalite self-extinguishing insulation is a product of Armstrong Cork Co., Lancaster, Pa.)

Check 2523 opposite last page.

Goggles resist fogging, protect from splash, spray, and impact

Uses: Recommended for protection against splashing liquids, spray, and impact of flying foreign particles.

Features: Goggles are indirectly ventilated, no vents in frame or holes in lenses, for splash-resistant safety. Tests indicate that they are more resistant to fogging than other similar goggles.

Description: Frame is molded from clear vinylite plastic. One-piece lens is made of impact-resistant acetate. It is available in clear or green. An all-rubber headband holds frame firmly in place. All parts are replaceable.

(AO 710 splash goggle is a product of Safety Products Div., American Optical Co., Southbridge, Mass.)

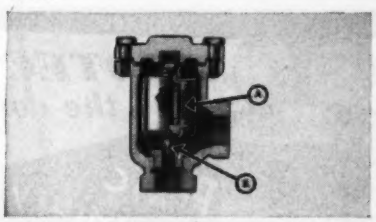
Check 2524 opposite last page.

Full-range steam traps cut high cost of steam pressure variations

By John W. Ritter, Test Engineer
SARCO Company, Inc.

While boiler room economics dictate that boiler pressures remain constant, the equally sound economics of batch processing may decree that pressures at the equipment vary with the requirement of the process. The attempt to choose a steam trap that is all things to all conditions may result in installing traps that operate inefficiently at either extreme of their pressure range or that require adjustment every time the operations sheet calls for another pressure-temperature setting. Orifice traps represent a somewhat more rational approach to the problem, but often at the price of a continuous discharge of steam, particularly at the low pressures of start-up and shut down. Compromise, adjustment, and steam waste all spell inefficiency in the utilization of steam.

Production-Planned steam trapping, on the other hand, improves efficiency by the use of properly designed and installed thermostatic steam traps. Such traps employ the expansion and contraction of a thermostatic element to operate the discharge valve.



In Sarco Thermostatic Steam Trap, element (A) expands at steam temperature to close valve (B), contracts to permit discharge of condensate.

In the Sarco "Balanced Pressure" Thermostatic Steam Trap a volatile fluid is sealed inside a metal bellows that opens or closes the valve as it contracts or expands with condensate temperature. Near steam temperature, evaporation of the fluid creates an internal pressure greater than steam pressure in the trap body, and the expanding bellows seats the valve. When the condensate cools, the element contracts and opens the valve.

It is evident that at steam temperature pressure inside the element is higher than steam pressure, no matter how the latter may vary. Thus, the trap compensates automatically for variations in pressure.

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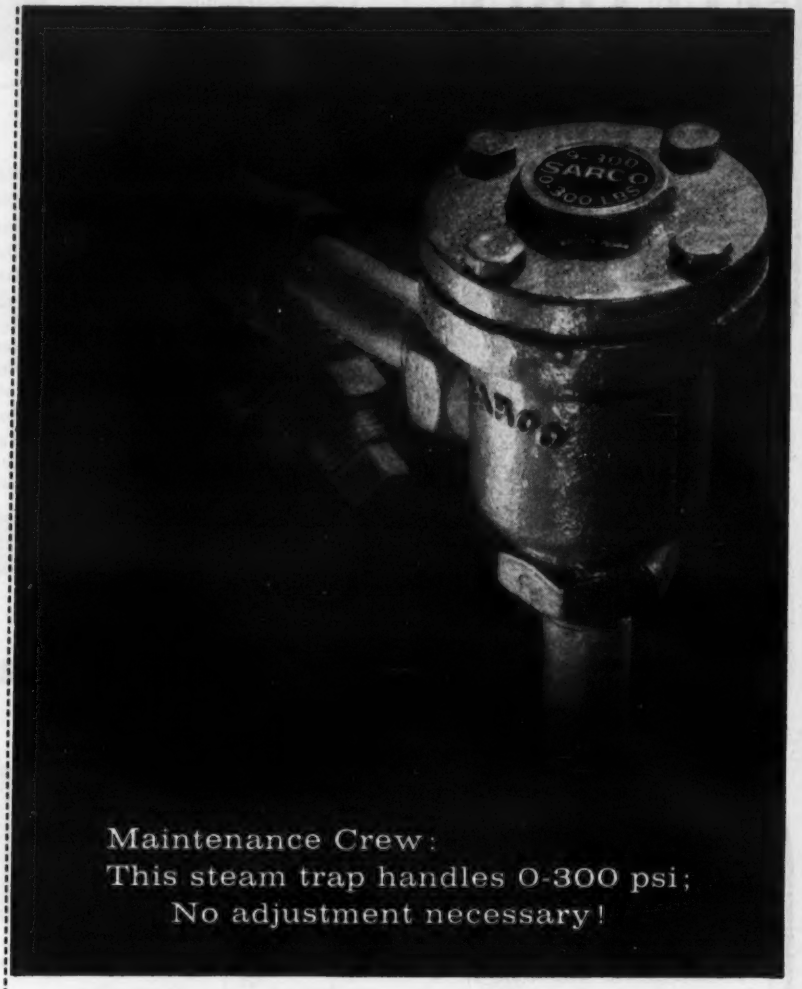


Sarco "Balanced Pressure" Thermostatic Steam Traps cut trap maintenance costs and simplify parts inventory. Why? Because the same bellows, head and seat handle steam pressures up to 300 psi — without any need of adjustment for variations in load or pressure.

Other advantages: unmatched capacity/cost ratio (1″ size discharges 9,650 lbs/hr. at 10°F below steam temperature, 125 psi). This trap can't air-bind and, when installed with free discharge, can't freeze.

Long life and reliable performance are assured by an exclusive Sarco process for fabricating the one moving part — the thermostat — and by steam-testing of every single trap at maximum rated pressure.

Write for "Literature Kit 1A" today. And remember, Sarco can give you impartial advice on *Production-Planned* steam trapping because . . .

SARCO
COMPANY, INC.
635 Madison Ave., New York 22, N. Y.

Only Sarco makes all 5 types:
Thermostatic • Liquid Expansion • Float Thermostatic
Thermo-Dynamic • Bucket

STEAM TRAPS • TEMPERATURE CONTROLLERS • STRAINERS • HEATING SPECIALTIES

Check 2525 opposite last page

FLEXIBLE TUBING

Made from

TEFLON*

For

Chemical Feed Lines (laboratory, catalyst, pilot plant reusable), Hot Corrosive Liquids or Steam Lines, Hydraulic Hose, Braiding and Fittings for Pressure Use

And Similar Applications Where Only PF TEFLON* Can Do The Job

PROPERTIES

- complete chemical inertness
- lowest coefficient of friction of any solid material
- very low permeability
- widest service temperature of any plastic (-450°F to +500°F)
- easily cleaned and sterilized without deterioration

Pa. F. flexible tubing is available in a full range of colors and sizes. Our extrusion techniques yield maximum service flexibility and all sizes are carefully inspected and controlled dimensionally.

Write, wire or 'phone for additional details, competent engineering assistance and prompt attention to special sizes and walls. Pressure testing and certification upon request.

PENNSYLVANIA FLUOROCARBON CO., INC.

1115 N. 38th St., Phila. 4, Pa., EV 6-0603

*"Teflon"—DuPont trade name for Tetrafluoroethylene resin

TWX PH 252

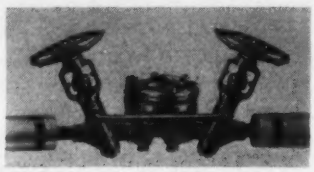
Check 2526 opposite last page

Steam trap by-pass made with only two joints

Valve combination assembly saves labor

Uses: Used wherever a by-pass piping setup is required for steam trapping.

Features: By-pass can be installed in about ½ hr by making only two joints. In



By-pass assembly cuts installation labor time from nine hours to ½ hr

conventional steam trap by-pass arrangements a minimum of 24 joints would have to be made and as long as nine hours spent in installation.

Description: Valve combination assembly contains the following components: shut-off valves with throttling feature and by-pass; air vent and check valve; strainer and steam trap. Unit can be installed in all positions. All traps and valves are carbon or alloy steel forgings. Valves can be welded at any specified angle.

(Piping king steam trap by-pass valve arrangement is a product of Velan Steam Specialties Inc., 37 S. River St., Plattsburg, N.Y.)

Check 2527 opposite last page.

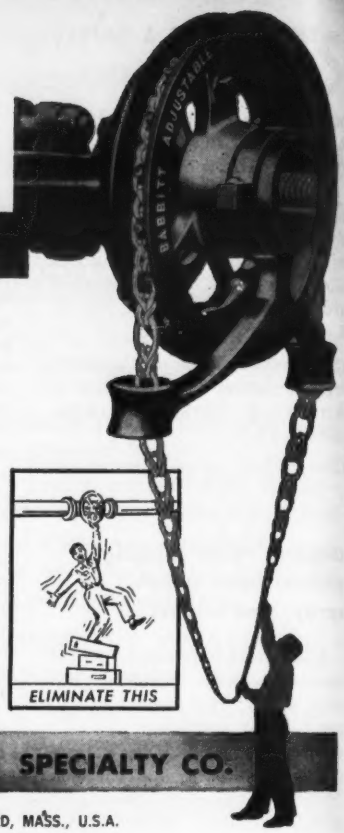
Roof repairs made even during rain with coatings

Permit maintenance work to go uninterrupted

Uses: Roof repair and maintenance including flashing, copings, gutters, and eavespouts during rain or snow.

Features: Roof repairs can be made even during a driving rainstorm. Uninterrupted roof maintenance work schedules can be maintained despite

Safe Operation of Overhead Valves with a



Babbitt

Adjustable

SPROCKET RIM

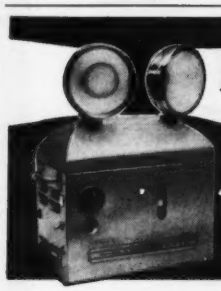
with Chain Guide

- Simplifies pipe layout
- Fits any size valve wheel
- Easy to install and operate
- Operates any valve from plant floor
- Time and money saving fixture
- No maintenance; first cost only cost
- Packed, completely assembled, one to a carton
- Hot galvanized, rust-proof chain available for all sizes
- Easy to follow instructions with each unit
- Your supplier carries complete stocks
- Write for new descriptive catalog sheet and prices

Babbitt STEAM SPECIALTY CO.

14 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

Check 2528 opposite last page



PROTECT AGAINST the consequences of LIGHT FAILURE

PANIC Injury DAMAGE SUITS THEFT

A CASE HISTORY *from our files . . .*

The Safety Director of a large Eastern distillery had recommended installation of Carpenter Automatic Emergency Lights. Procrastination was responsible for delaying purchase for several weeks, with the result that a simple blown fuse caught everyone unprepared.

During a night shift, lighting circuits to the Bottling Department went dead, while the machinery, fed by high-voltage lines, kept clanking on. In the resulting panic, women stumbled into the racing machines. Exit stairwells were darkened, too, and falls added to the toll. Only chance prevented loss of life.

Within days, the management installed Carpenter Automatic Lights throughout this plant and eight others.

The tragedy in this instance was the delay after the hazard had been recognized, and proper protection decided upon . . . For just one WATCHMASTER AUTOMATALITE would have prevented the misfortune. Each AUTOMATALITE now stands as a mute yet tangible symbol of the need for immediate protection.

Only "WATCHMASTER" AUTOMATALITES have

EXCLUSIVE • Powerful, sealed-beam floodlights with strong center punch to illuminate long corridors and pin-point exits or critical stations, etc.

EXCLUSIVE • "Hydro-Caps" to prevent water loss from batteries. Add water only once every year or two. Lower Maintenance costs.

Explosion-proof lights for hazardous areas . . . Write for details.

CARPENTER MFG. COMPANY

424 Bradley Street, Somerville 45, Mass. Telephone MOnument 6-4300

Check 2529 opposite last page

weather inconsistencies.

Description: Two products permit most roof repairs. Liquid Damp-Dek is a roof coating. It contains domestic waterproofing oils and high-absorption Canadian asbestos fibers. Asphaltic penetrating and sealing oils penetrate surface dampness.

Second product, Plastic Damp-Dek, is a patching cement for wet type weather repairs on roof flashings, seams, holes, gutters, and eave-spouts. It is heavier in body and compounded in paste consistency to be trowel applied.

(Liquid Damp-Dek and Plastic Damp-Dek are products of The Monroe Company, Inc., 10703 Quebec Ave., Cleveland 6, Ohio.)

Check 2530 opposite last page.

Massive depth filtering feature of molecular sieve filter-drier

Compact units hold acid concentration low

Uses: Filtering or drying of oils or refrigerants.

Features: Units use a molecular sieve for massive depth filtration. They remove and retain up to 20% of their weight in water at 140°F. Acid concentrations are maintained below dangerous corrosion limits.

Description: Heart of filter-drier is molecular-sieve cartridge. Distributor directs refrigerant or oil flow uniformly thru filter and large-diameter short desiccant bed. Particles as small as 100 microns are trapped and held. Pressure drop is negligible, minimum bursting pressure is 2500 psi.

(Molecular sieve filter-driers are a product of Remco, Inc., Zelienople, Pa.)

Check 2531 opposite last page.

Safety tongs for handling hazardous items in the laboratory and in industrial applications are illustrated and briefly described in Bul N-200 — Palo Laboratory Supplies, Inc., 81 Reade St., New York 7, N.Y.

Check 2532 opposite last page

POWELL

world's largest family of valves

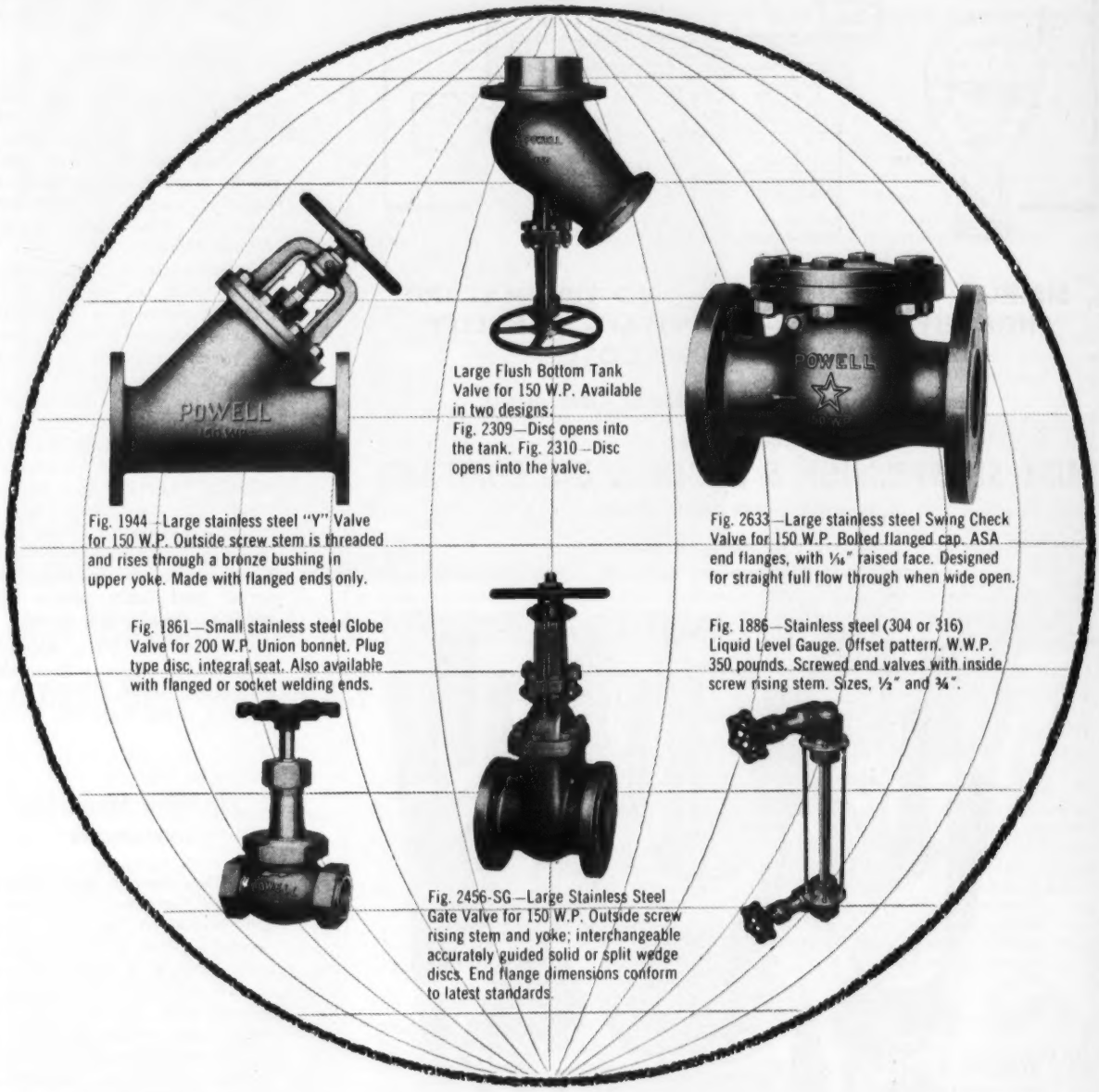


Fig. 1944—Large stainless steel "Y" Valve for 150 W.P. Outside screw stem is threaded and rises through a bronze bushing in upper yoke. Made with flanged ends only.

Large Flush Bottom Tank Valve for 150 W.P. Available in two designs: Fig. 2309—Disc opens into the tank. Fig. 2310—Disc opens into the valve.

Fig. 2633—Large stainless steel Swing Check Valve for 150 W.P. Bolted flanged cap. ASA end flanges, with 1/16" raised face. Designed for straight full flow through when wide open.

Fig. 1861—Small stainless steel Globe Valve for 200 W.P. Union bonnet. Plug type disc, integral seat. Also available with flanged or socket welding ends.

Fig. 1886—Stainless steel (304 or 316) Liquid Level Gauge. Offset pattern. W.W.P. 350 pounds. Screwed end valves with inside screw rising stem. Sizes, ½" and ¾".

Fig. 2456-SG—Large Stainless Steel Gate Valve for 150 W.P. Outside screw rising stem and yoke; interchangeable accurately guided solid or split wedge discs. End flange dimensions conform to latest standards.

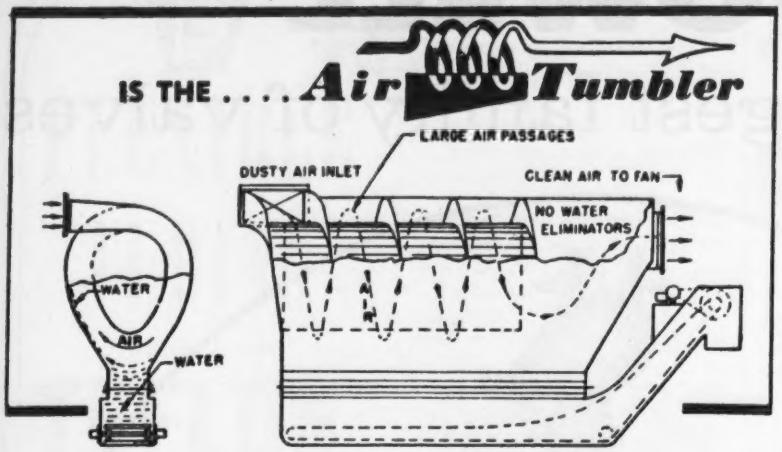
A solution for every kind of flow control problem is as near as your local Powell distributor. Powell valves are designed and engineered in the largest variety of metals and alloys, to handle any medium, every flow control requirement. There are Powell distributors in all principal cities. Or, if yours is a special engineering problem, write to:

THE WM. POWELL COMPANY • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**

Check 2533 opposite last page

The MASTER of DUST in INDUSTRY

IS THE .... Air Tumbler



SIMPLE — DEPENDABLE — NO FIRE HAZARD
HIGH EFFICIENCY — CONSTANT CAPACITY
LOW OPERATING COST

More than one million CFM in ONE plant

Write for Bulletin No. 581. Address:

DUST SUPPRESSION & ENGINEERING COMPANY

P. O. BOX 67, LAKE ORION, MICHIGAN

Agents in all principal U. S. cities

Check 2534 opposite last page

Ask for Bulletin 27

Wire Mesh Products Cut engineering and production costs with Jelliff's facilities for precision-forming special filters and strainers in any quantity.

THE C. O. JELLIFF MANUFACTURING CORPORATION

SOUTHPORT, CONNECTICUT

SERVING INDUSTRY FOR 78 YEARS

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recent books

reviews of current technical and reference work . . . summarized for you by authorities in the field with the CP staff

Vinyl Resins

This present 282-page volumn by W. Mayo Smith, is the seventh in the Reinhold Plastics Applications Series. Mr. Smith is presently Director of Research and Development, Escambia Chemical Corp., Wilton, Conn.

Prepared in a semi-technical manner, the current volumn is extremely practical. Information pertinent to manufacturers, fabricators, and market developers is presented in detail. Every attempt is made to cover all the recent advances in the vinyl field. New polyvinyl chloride "pearls" and Delrin resin are included. Many items expected to show unusual growth such as vinyl laminates, rigids, foamed material, and latex paints are brought clearly into focus.

To obtain "The Vinyl Resins" remit $5.75 collect to Reinhold Publishing Corp., 430 Park Avenue, New York 22, N. Y.

Electronic Measuring Instruments

Written for the instrument engineer, instrument user, and the advanced student, this second edition of E. H. Banner's text is a broad survey of the principles of electronic instruments, their principal types, and component devices.

The continuously growing range of electronic measuring instruments prevents the book from being completely up-to-date and covering every class of electronic measuring instruments. But this second edition has been completely revised to include many new subjects and some sections are rewritten and enlarged.

Vacuum and cathode-ray tubes are described, followed by two sections on measuring instruments embodying these elements. A section on radiation measurement is included. Instruments covered include industrial, scientific, medical.

This completely-revised edition of 496 pages contains over 100 additional pages of additional data covering the late developments in the electronics field.

To obtain "Electronic Measuring Instruments," remit $7.95 direct to The Macmillan Company, 60 Fifth Ave., New York 11, New York.

Check 2536 opposite last page.

The Properties of Gases & Liquids

No authors do more for the chemical engineer than those who make painstaking searches of the literature of their subjects, winnow and sift the material, digest it thoroughly, and present critical reviews in a condensed and usable manner. Sherwood and co-authors have engaged in such worthwhile work before, but perhaps never more helpfully than in this 386-page book by Reid and Sherwood of the Massachusetts Institute of Technology.

Leading off happily with critical properties, they proceed thoughtfully to an informative treatment of pressure-volume-temperature relationships, take up vapor pressures and latent heats, and present a long chapter on heats, free energies of formation, and heat capacities. The authors report the best means of correlating viscosity and thermal conductivity data, deal capably with diffusion coefficients, and treat exhaustively but clearly the subject of vapor-liquid equilibria.

Bristling with excellent line cuts and well-designed tables, the book is exceptionally

well-documented and adequately indexed. Those who teach chemical engineering calculations and thermodynamics will be grateful for the wealth of authoritative data collected conveniently under one cover. Those who must study alone will appreciate the generous number of study problems worked out in full. Typographical errors are gratifyingly few.

To obtain "The Properties of Gases and Liquids," remit $10.00 direct to McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, N. Y.

Automatic Control: Principles and Practice

Written by Werner G. Holzbock, who has authored numerous articles on instrumentation, this 258-page volume offers the practical results of scientific research on control systems in non-mathematical terms.

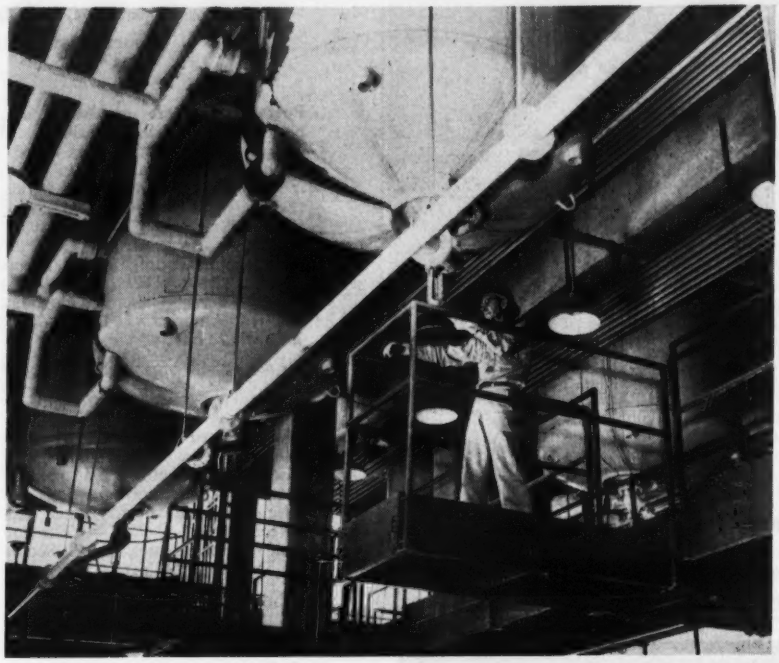
The volume will provide laymen and technicians alike with a sound coverage of principles and application. The text begins with dynamic behavior of control systems including static requirements and adjustments for peak performance. Next, it covers mechanical and electrical components—measuring elements, controllers, and the specific part played by control valves. Final section describes various control systems and specific applications.

The approach of the text is descriptive rather than mathematical. For example, the material on servo systems is concerned with practical concepts instead of theory.

To obtain "Automatic Control: Principles and Practice," remit $7.50 direct to Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y.

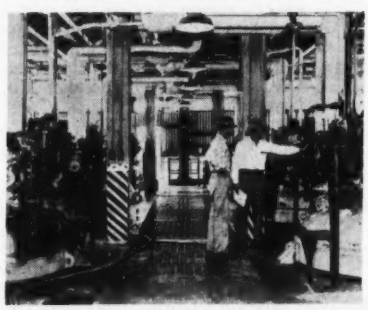
For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

PFAUDLER CORROSIONEERING NEWS



How Diamond Alkali uses Glasteel to cut turn-around time and protect purity at its PVC plant

Like most polymers, polyvinyl chloride gets so sticky in process that it gums up equipment surfaces to the point that a general clean-out is usually required after each batch.



Wishing to avoid such unproductive, unprofitable time at its new Deer Park, Texas plant, the Diamond Alkali Company instructed its engineers to run comparative tests on materials of construction.

Pfaudler Glasteel was the final choice and Diamond Alkali uses it wherever possible in the new plant . . . for polymerizers, blow-down tanks, storage and receiver tanks, and even for pipes and valves.

So little of the PVC clings to the smooth glassed surfaces of this equipment, a simple fast flush is all that's necessary to keep it in process condition.

During two years of operation, on a twenty-four hour a day basis, production has been halted only for routine maintenance.

Protects purity too

Pfaudler Glasteel is chemically inert to the ingredients and catalysts used in making PVC . . . so there can never be any contamination of Diamond Alkali's product.

Special agitator seals on the polymerizers prevent any lubricants from bleeding into the product.

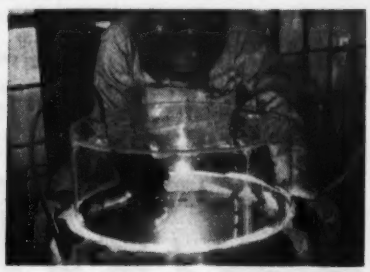
The equipment is so designed and controlled that Diamond Alkali can hold temperatures to within ½° F. of a desired setting.

If you would like to know more about Pfaudler Glasteel and the equipment made with it, check the coupon for our Bulletins 968 and 932.

Big zirconium and titanium heat exchangers now available

Recent addition of vacuum-purge inert gas welding to the already established flow-purge inert gas welding chamber shown below, places Pfaudler in the advantageous position of offering the most advanced facilities for welding the highly corrosion-resistant metals, titanium and zirconium. Now several hundred square feet of heat transfer surface can be more economically and rapidly produced.

Add these metals to your list of available Pfaudler materials for fighting corrosion in process equipment—an ever growing list that already includes Glasteel, stainless steel, Hastelloy, nickel, Inconel, and Monel.



The unit being worked on in the picture is one of the largest zirconium exchangers built to date, having 134 square feet of heat transfer area. Sixty-four 1" O.D. 18 gauge seamless zirconium tubes in a 21" O.D. shell 8' long. Designed for 75 psi and 350° F. it forms the calandria section of an evaporator for concentrating hydrogen peroxide solutions.

Pfaudler Bulletin No. 949 describes the complete line of metal and alloy heat exchangers. Heat transfer equipment of Glasteel construction are covered in Bulletins No. 921 and No. 886. Send the coupon for copies.

PROCESS EQUIPMENT by PFAUDLER
a division of PFAUDLER PERMUTIT INC.
Dept. CP-118, Rochester 3, N.Y.

Please send me ☐ Bul. 968 and 932, Buyer's Guide; ☐ Bul. 949, Heat Exchangers; ☐ Bul. 921 and 886 on Glasteel Heat Transfer Equipment.

Name_____

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Check 2537 opposite last page

the WHY & HOW of selecting

VIKING ROTARY PUMPS

Viking Pumps will do a multiple number of jobs for you at less cost.

WHY . . . They are self-priming; they will handle foam and entrained gases without complaint. They will meter in direct response to speed control and hold the same flow against widely varying pressures. They are reversible.

Standard and heavy duty models cover capacities from ⅔ to 1050 GPM, pressures up to 200 PSI. Liquid viscosities present no problems. Thin, non-lubricating liquids or heavy, viscous liquids can be pumped successfully.

The temperature range is very broad (500° F. is not uncommon). Available in many types of construction—iron, bronze, niresist, steel, nickel, stainless and other metalurgies. Packed or mechanical sealed shafts are optional.

Choice of over 750 catalogued models and thousands of specially constructed pumps . . . widest in the industry.

HOW . . . To help you select the right Viking Pump for your job, ask for Catalog KCC It answers your rotary pump problems in an easy-to-understand way.

VIKING PUMP COMPANY

Cedar Falls, Iowa, U. S. A. • In Canada, It's "ROTO-KING" pumps
See Our Unit in Chemical Engineering Catalog

Check 2538 opposite last page

Allflex

STAINLESS STEEL "MNH" FLEXIBLE CONNECTORS

A NEW stock answer to pipeline problems caused by rigid connections.

- Dampens Vibration
- Compensates for Misalignment
- Permits Offset Movement
- Absorbs Expansion

With ALLFLEX Stainless Steel Connectors you get:

- **CORROSION RESISTANCE . . plus**
- **PRESSURE RESISTANCE . . plus**
- **HEAT RESISTANCE . . plus**
- **FLEXIBILITY**

Also available in Monel, Bronze and Steel.

WRITE TODAY for fact-filled ALLFLEX Bulletin

THESE STOCK SIZES

¼" ⅜" ½" ¾" 1" 1¼" 1½" 2"

IN THESE STOCK LENGTHS

12" 18" 24" 30" 36" 48" 60"

. . . also available in all standard sizes, in any required length, with any standard or special fitting or flange. Full engineering information on ALLFLEX Stainless Steel Hose can be found in: Chemical Engineering Catalog, pages 153 to 156; Refinery Catalog, pages 169 to 172 (Allied A, B, C, D)

ALLFLEX Standard Stainless Steel Connectors are sold through leading Industrial Distributors. If not available locally—THEY CAN BE SHIPPED FROM FACTORY SAME DAY ORDER IS RECEIVED.

ALLIED METAL HOSE COMPANY

3784 Ninth Street, Long Island City 1, N. Y. • Stillwell 4-5173

Check 2539 opposite last page

new literature

Industrial bulletins pertinent to the reader . . . offering data on products, processes, services. Additional reviews of catalogs, bulletins, data sheets, etc., are found throughout other sections of this magazine

Polyvinyl acetate emulsions employed in finishing fabrics of cotton and synthetic fibers are explained in technical bulletin which includes description of emulsions, their advantages and application procedures. Also discussed is information on storage and handling, compounding materials and sources. Bul NP-28 — Celanese Plastics Div., Celanese Corporation of America, 744 Broad St., Newark 2, N.J.

Check 2540 opposite last page.

Cyclone dust collectors are subject of an 8-page bulletin that details design and structural features, and includes application drawings and discussion on performance and selection. Bul C-958 — The Ducon Company, Inc., 147 E. Second St., Mineola, N. Y.

Check 2541 opposite last page.

Belt conveyors, horizontal and inclined, are illustrated in four-page bulletin which gives complete details on dimensions, features, and uses. Cat 80 — The E. W. Buschman Company, Clifton and Spring Grove Aves., Cincinnati 32, Ohio.

Check 2542 opposite last page.

Bus and switch installations for electrolytic and electrothermal processes are discussed in 12-page bulletin. Information is given on how to save money on low-voltage bus fabrication and high-voltage switches. Bul on bus and switch installation — R & IE Equipment Div., I-T-E Circuit Breaker Co., Greensburg, Pa.

Check 2543 opposite last page.

Pneumatic trailer for delivery of any dry powdered or granular material is covered in bulletin which cites advantages and specifications. Bul 315 — Albert Air Conveyor Corp., 600-16th St., Oakland 12, Calif.

Check 2544 opposite last page.

For more information on developments reported in this section, check corresponding numbers on Reader Service Slip opposite last page of this issue.

Electric ovens, furnaces, baths, temperature control equipment and accessories are illustrated and described in 200-page general catalog. Incorporates a 16-page technical section. Cat 158 — Blue M Electric Company, 138th & Chatham St., Blue Island, Ill.

Check 2545 opposite last page.

Flow transmitter that gives fully linear pneumatic signal based on true flow rate is covered in company publication. Accuracy to 1% based on air output versus actual flow rate is reported. Spec Sheet SS-170-1 — Brooks Rotameter Co., 1158 A St., Lansdale, Pa.

Check 2362 opposite last page.

Insulation fundamentals handbook of 16 pages has been compiled to present, in a practical and simple manner, solutions to some of the field problems concerning insulation. "Fundamentals of Industrial Insulation" — The Aber Company, Houston, Texas.

Check 2546 opposite last page.

Safety bung, designed to protect against explosion of volatile liquids in drums and storage, is detailed in two-page bulletin. Included are application information, cut-away drawings, and complete engineering information. Bul F-17 — OPW Corporation, 6013 Wiehe Rd., Cincinnati 13, Ohio.

Check 2547 opposite last page.

Valve catalog — Condensed catalog of 12 pages lists 212 popular valves, 19 of which have never been catalogued before. Convenient specification tables provide source for quick valve selection. Condensed Cat P&H-58 — A. W. Cash Valve Mfg. Corp., PO Box 191, Decatur, Ill.

Check 2548 opposite last page.

Resin wall chart is compilation of important and interesting data concerned with manufacturer's resinous products. Suggested uses and applications are included. Resinous products wall chart — Emerson & Cuming, Inc., 869 Washington Street, Canton, Mass.

Check 2549 opposite last page.

Level indication and control units for all bulk material are covered in 20-page consolidated catalog which includes illustrations, specifications, and actual and suggested systems and applications. Form BD-15 — The Bin-Dictator Company, 1394643 Kercheval Ave., Detroit 15, Mich.

Check 2550 opposite last page.

Logarithmic mean temperature difference can now be found easily and correctly with 8½ x 11" chart developed by manufacturer so users and prospective users of heat transfer equipment can do their own designing and cost estimating. LMTD Chart — Dean Thermo-Panel Coil Div., Dean Products, Inc., 616 Franklin Ave., Brooklyn 38, N.Y.

Check 2551 opposite last page.

pH control system described in four-page, two-color bulletin. System is designed to continuously measure pH at pressures and temperatures to 200 psi and 200°C. Model 904 Bul — Western Div., Canadian Aviation Electronics, Ltd., 387 Sutherland Ave., Winnipeg, Manitoba.

Check 2552 opposite last page.

Outdoor storage pile protection with water-base spray is discussed in four-page illustrated bulletin that lists nine typical materials in recommended compound grades. Bul P58-1 — The Johnson-March Corp., 1724 Chestnut St., Philadelphia 3, Pa.

Check 2553 opposite last page.

Titanium fittings for high-pressure/high-temperature applications are described in brochure. "Titanium Fittings" — Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.

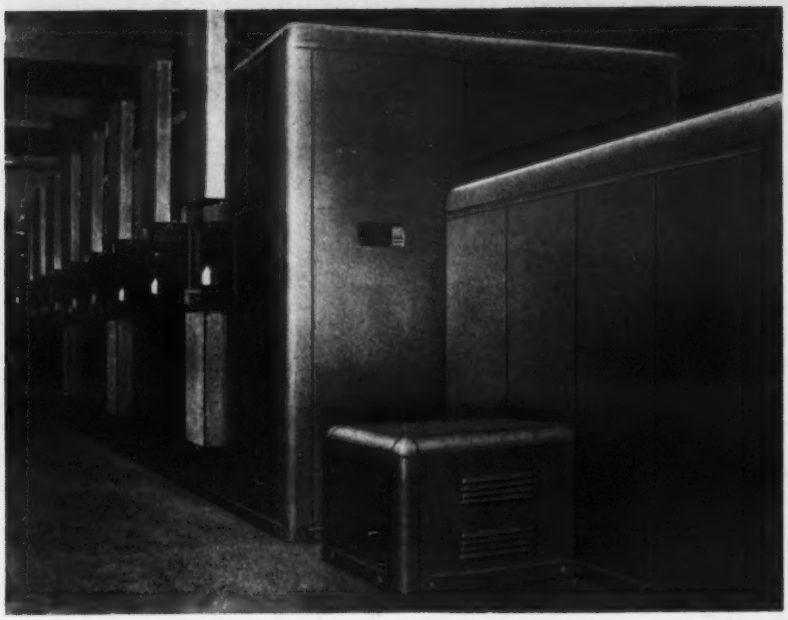
Check 2554 opposite last page.

Paint film studies, Parts II and III are concerned with regular pigment/volume concentration of paints and water vapor resistance of latex paint films. Presented in tabular form, the data on both studies are briefly summarized in four-page Tech Bul 35—Wet Ground Mica Association, Inc., 420 Lexington Ave., New York 17, N.Y.

Check 2555 opposite last page.

Belt idler's development from laboratory to installation is outlined in eight-page illustrated Bul 925 — The Jeffrey Manufacturing Company, Columbus 16, Ohio.

Check 2556 opposite last page.



"NATIONAL" PERFORATED APRON CONVEYOR DRYER

Evidence of the outstanding efficiency and economy of this "National" drying unit is found in the number of existing and on-order installations among the Nation's leading chemical manufacturers.

Increased drying capacity per square foot of surface; improved uniformity of dried product; much easier apron cleaning; greater efficiency and accessibility of gas or steam heaters; and a generally neater machine to operate and maintain, are characteristics of this drying system resulting from unique and exclusive features of "National" design, construction, operation and control.

The same type of dryer is used by the Nation's leading manufacturers of synthetic fibres.

The following well-known companies are among the current users of "National" Perforated Apron Conveyor Dryers:

AMERICAN VISCOSE CORPORATION
ARMOUR & COMPANY
THE PHILIP CAREY MANUFACTURING CO.
DAVISON CHEMICAL COMPANY, DIV. OF W. R. GRACE & CO.
DU PONT COMPANY OF CANADA (1956) LTD.
E. I. du PONT de NEMOURS & CO.
THE GENERAL TIRE & RUBBER CO.
CONGOLEUM-NAIRN, INC.
O. M. SCOTT & SONS CO.
A. E. STALEY MANUFACTURING CO.
AMERICAN ENKA CORP.
NATIONAL ANILINE DIVISION, ALLIED CHEMICAL & DYE CORP.
NATIONAL METAL EDGE BOX CO.
CANADIAN INDUSTRIES, LTD.
RADIO CORPORATION OF AMERICA
THE DOW CHEMICAL CORP.
CHEMSTRAND CORP.
UNION CARBIDE & CARBON CORP.

Write for Literature Describing These "National" Dryers and Typical Installations.

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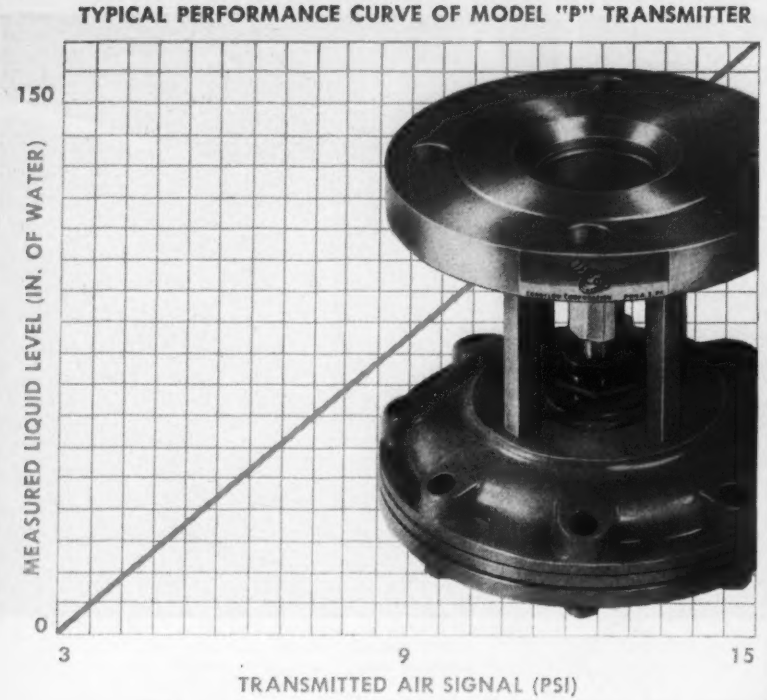
Cable Address: "NADRYMA"—W. U. Code

Check 2557 opposite last page

TYPICAL PERFORMANCE CURVE OF MODEL "P" TRANSMITTER



NEW

CONOFLOW

LIQUID LEVEL

& PRESSURE

TRANSMITTER

WITH

Exclusive

ISOLATED

MEASURING

DIAPHRAGM

The Conoflow Model "P" Transmitter **is a rugged instrument which measures pressure and liquid level and transmits a *linear* 3-15 psi signal to standard receiver elements. Incorporates these cost-saving features:**

Safety—**Process liquids and gases cannot back up through air lines and damage costly instruments. This is guaranteed by the complete separation of measuring diaphragm from pneumatic pilot.**

Simple Installation—**The Model "P" can be mounted either horizontally or vertically on open or closed vessels. No dip tubes, floats or other mechanical devices are required inside the tank.**

Long Life—**Only the corrosion-resistant *Inconel X* diaphragm is exposed to the measured material. Preformed diaphragm will not work-harden or fatigue; withstands pressures to 500 psi and temperatures to 450°.**

Versatile—**Can be used for practically any service; ideal for viscous fluids or materials with solids in suspension; also for flowing bulk materials such as pigments, flakes, etc.**

Choice of Ranges—**Available for measuring ranges as low as 0 to 100" of water and pressures as high as 250 psi. Ranges can be changed in the field.**

Specifications—**Bulletin P-2520-3 contains complete specifications on the Conoflow Model "P" Transmitter. Write for your copy today or let us quote on your requirements. No obligation. Conoflow Corporation, 2100 Arch Street, Philadelphia 3, Pa.**

CC-802

Conoflo Controls® | **CONOFLOW CORPORATION** *FOREMOST IN FINAL CONTROL ELEMENTS* | Subsidiary of Walworth

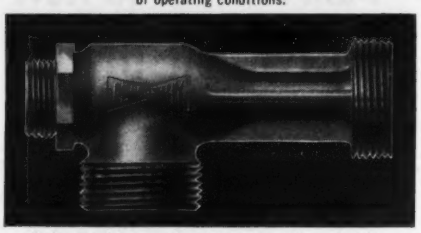
Check 2558 opposite last page

Simplify handling of

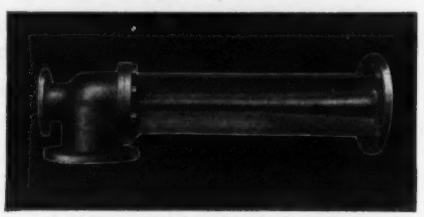
fluids, vapors, gases . . .

and "HOT" MATERIALS

Series 1A and 20A Ejectors perform efficiently over a wide range of operating conditions.



Series 60A fluid operated jet pump for lifting, elevating and blending liquids or slurries.



Special jet pump for handling corrosive chemicals. Stainless steel with flanged connections.

Low-cost, compact Penberthy ejectors provide many unique dependable services in AEC operations, chemical and petroleum processing, power, water and sewage handling and many other industries.

Through long specialized experience, Penberthy has successfully adapted the simple jet principle to a variety of applications. Penberthy ejectors are now incorporated into numerous OEM products; are being used increasingly where mechanical pumps simply cannot be used or are at an economic disadvantage.

They are available in standard, modified and specially designed models from a variety of materials. Worth investigating, Penberthy jet pumps are detailed in Catalog 512R — sent on request.

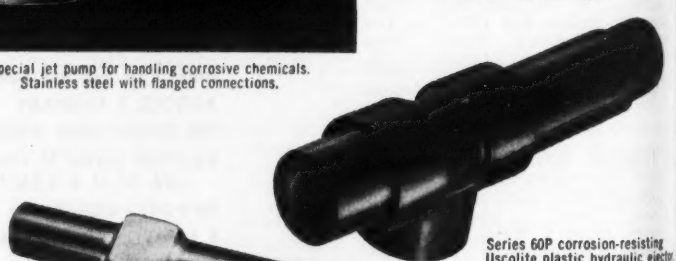
PENBERTHY

MANUFACTURING COMPANY

Division of the Buffalo-Eclipse Corporation

1242 Holden Avenue, Department CP

Detroit 2, Michigan



Series 60P corrosion-resisting Uscolite plastic hydraulic ejector. Rigid. Tough. Lightweight.

Special stainless steel where corrosion resistance and/or non-contamination are required.

PENBERTHY EJECTORS

STEAM, AIR & LIQUID OPERATED FOR:

Liquid Transfer, Heating, Circulating, Aerating, Agitating, Mixing, Pumping, Blending and Exhausting Air or Vapor against High Vacuum.

There's Certain Satisfaction in **PENBERTHY Cycling Jet Pumps • Ejectors Injectors • Electric Sump Pumps**

Check 2559 opposite last page

Paint check chart gives information on more than 20 different types of coatings, telling how to choose best coating for a given application. Paint Selection Check Chart — The Wilbur & Williams Co., 130 Lincoln St., Boston (Brighton) 35, Mass.

Check 2560 opposite last page.

Internal visual inspection of blind rivets, parts, propellers, blades, tubes, pipe, towers, furnaces, etc. can be accomplished through precision-made borescopes ranging in size from a few inches to more than 60′ in length, according to manufacturer's illustrated four-page Borescope Folder—Lenox Instrument Co., 2012 Chancellor St., Philadelphia 3, Pa.

Check 2561 opposite last page.

Gas chromatography notebook of 24 pages, complete with photographs, graphs, and traces, demonstrates techniques on fatty acids and terpene analysis. Additional pages will be forwarded periodically on current developments. Gas Chromatography Notebook — Wilkens Instrument & Research, Inc., PO Box 313, Walnut Creek, Calif.

Check 2562 opposite last page.

Tank weighing systems, low-capacity, low-price, packaged type, designed specifically for the 0 to 1000-lb range, are described in detail in bulletin that provides an easy-to-use method of figuring system costs. Bul 582 — The A. H. Emery Company, Pine St., New Canaan, Conn.

Check 2308 opposite last page.

Pneumatic conveyors — Bulletin of eight pages includes block diagrams depicting relationship of equipment components for straight vacuum, straight pressure, and combination pull-push pneumatic handling systems. Case history examples of installation are included. Bul ER-G-2 — Fuller Company, subs. of General American Transportation Corp., Catasauqua, Pennsylvania.

Check 2563 opposite last page.

Sewage disposal plant equipment is described in 24-page revised bulletin which includes construction, installation, and maintenance of sewage gas meters, as well as typical piping arrangement, and instructions on how to read index on large capacity gas meters. Bul C-5200-3 — Meter and Valve Div., Rockwell Manufacturing Co., 400 North Lexington Ave., Pittsburgh 8, Pa.

Check 2564 opposite last page.

Tailor-made, tough and chemically inert...

... these J-M Chempac Teflon components combat chemical and solvent action!*

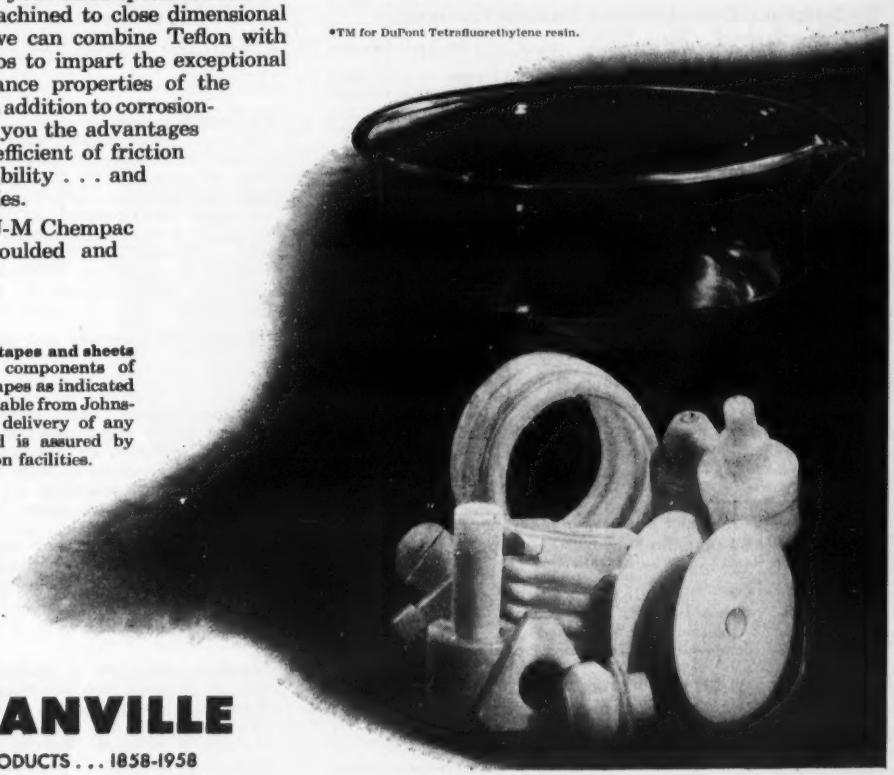
SMALL OR LARGE . . . intricate or simple . . . J-M Chempac® Teflon components have proved their exceptional resistance to the constant attack of corrosive chemicals in rugged service.

Look to J-M for Teflon packings, gaskets, and moulded shapes made to your exact specifications . . . or for parts that are machined to close dimensional tolerances. Moreover, we can combine Teflon with top quality J-M asbestos to impart the exceptional sealing and heat-resistance properties of the "magic mineral." And in addition to corrosion-resistance, Teflon gives you the advantages of an extremely low coefficient of friction . . . toughness and flexibility . . . and weight-saving possibilities.

You can also obtain J-M Chempac Teflon Packings in moulded and braided types for pumps and valves . . . in a wide range of flange and envelope-type gaskets . . . in rings, cups, sheets and tapes. Your J-M Packings Distributor can supply your needs. Or write Johns-Manville, Box 14, New York 16, New York. In Canada: Port Credit, Ontario.

*TM for DuPont Tetrafluorethylene resin.

Teflon rods, tubes, tapes and sheets —in addition to components of varied sizes and shapes as indicated here—are also available from Johns-Manville. Prompt delivery of any quantity you need is assured by new J-M production facilities.



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These Flexible Coated
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Provide Long Wearing Liquidtight
Protection For Materials Handling

Neoprene Coated Flannel Stanzoil Pacemakers

Length	Style	Weight	Model
10″	Knit wrist	Light	80
10″	Knit wrist	Industrial	90
10″	Knit wrist	Heavy Duty	95
10″	Gauntlet	Industrial	100
10″	Gauntlet	Heavy Duty	105
12″	Gauntlet	Industrial	120
12″	Gauntlet	Heavy Duty	125
14½″	Gauntlet	Industrial	140
14½″	Gauntlet	Heavy Duty	145
18″	Gauntlet	Industrial	180
12″	Gauntlet	Twin lined*	225

* No. 225 designed to protect hands from extreme hot and cold temperatures.

Pylox™ Coated Jersey Stanflex

Model	Style	Size	Length
5062	Knit wrist	Men's	10″
5052	Knit wrist	Women's	10″
5232	Band top	Men's	11″
5132	Gauntlet	Men's	12″
5252	Gauntlet	Men's	14½″

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Check 2566 opposite last page

NEW LITERATURE

Actual prices of filters, tanks, agitators, and other processing and laboratory equipment are cited in spiral-bound 90-page catalog. Drawings, tables, charts, and data sheets give full descriptions of individual units and accessories. Sixteen pages of handy tables list data on temperature conversion, capacities of tanks, steam temperatures, and corrosion resistance of metals. Processing equipment cat — Star Tank & Filter Corp., 871 Edgewater Road, New York 59, New York.

Check 2567 opposite last page.

Cargo pumps — Single-stage units in a capacity range of 2500 to 7000 gpm, are detailed in six-page bulletin. Cross-sectional view shows pump design, and detailed information on construction and dimensions is provided. Form 7493 — Ingersoll-Rand Company, 11 Broadway, New York 4, N.Y.

Check 2568 opposite last page.

Soy Proteins—High-purity isolated soy proteins are covered in three bulletins which include specifications, uses, preparation of various dispersions and solutions, viscosity data, preservatives, and compatible materials. Buls on Adpro 112, Adpro 220, and Adpro 410—Archer-Daniels-Midland Co., 2795 Sharon Rd., Cincinnati 41, Ohio.

Check 2569 opposite last page.

Perforated metals — Catalog of 156 pages on perforated materials presents new technical data along with illustrations of new industrial and decorative patterns. Over 30 pages are devoted to illustrating how perforated metals are used. General Cat 75 — The Harrington & King Perforating Co., Inc., 5636 Fillmore St., Chicago 44, Ill.

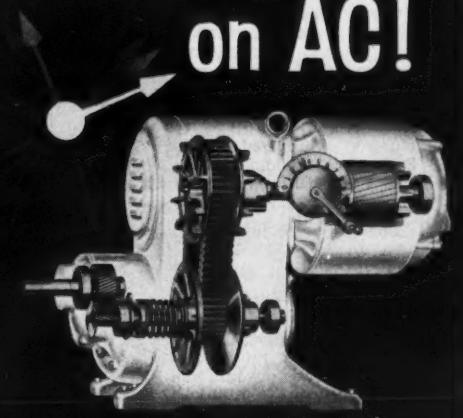
Check 2570 opposite last page.

Plastics catalog and technical manual of 74 pages provides detailed information on characteristics and applications of wide variety of plastics materials in the form of sheets, rods, tubes, balls, liquid, and film. Plastics cat may be obtained by letterhead request to Auburn Plastic Engineering, 4916 S. Loomis St., Chicago 9, Illinois.

Stainless steels for a variety of special purposes are described in detail in 32-page booklet. Several pages of data on corrosion resistance is included. "Special Purpose Stainless Steels" — Washington Steel Corp., Washington, Pa.

Check 2571 opposite last page.

any RPM simply on AC!



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So *simple* to get any speed you want, directly from standard AC power lines—with U.S. VARIDRIVE MOTORS! One compact, self-contained unit does it. With U.S. VARIDRIVE, you don't have to buy a DC converter, DC generators, complicated and delicate electronic circuits. Just *plug in* this one simple unit—dependable, easy for your regular personnel to maintain. You merely dial, and get smooth, stepless speed changes immediately! Thus, you set speeds for maximum production as needs vary...*increase* machine efficiency...output...product quality! *Decrease* costs...rejects...manpower and materials waste! Available in RATINGS: ¼ to 60 H.P. Specify: "U.S. VARIDRIVE MOTOR."

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FREE FLOWING!
DUST FREE!
BLENDS AND MIXES EASIER!

CRYSTAMET 2040 is the name of the new Cowles sodium metasilicate pentahydrate that resists caking, mixes quickly and remains dust free.
Granules are rounder, smoother, more uniform in size . . . the result of a new exclusive Cowles process.

Supplied in both 20-40 and 10-20* ranges*
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Write on your company letterhead for a sample of Crystamet 2040 or 1020 and a technical data sheet.

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Cleveland 3, Ohio

Check 2573 opposite last page

NEW LITERATURE

Spray nozzles — Catalog of 28 pages covering spray nozzles and nozzle accessories contains rating charts and specifications, flow vs pressure chart, and pipe and hose friction tables. Cat 33 — Delavan Manufacturing, West Des Moines, Iowa.

Check 2574 opposite last page.

Strip-chart recorder, of plug-in design, on which all settings and adjustments are made from the front is detailed in catalog. Rectilinear chart travels from left to right, gives continuous 30-day record, three-hour visibility. Cat 98286 — Taylor Instrument Companies, Rochester, N.Y.

Check 2343 opposite last page.

Russian technical terms and useful expressions to aid engineers trying to read Russian technical magazines are contained in reprint of paper delivered at ASME-AIChE Heat Transfer Conference, August 18-21. Paper includes concise vocabulary together with an explanation of, and pronunciation guide for, the Russian alphabet. Primary purpose of paper is to enable engineers to recognize enough words and phrases to know whether a Soviet technical article is worth translating. To obtain copies of paper, "Russian Vocabulary for Heat Transfer Literature" remit 50c (25c to ASME members) direct to Order Department, The American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

Couplings, quick-connect, disconnect, are described in 26-page catalog. Construction details, dimensions, and flow and pressure drop data are provided. Couplings Cat — Snap-Tite, Inc., Union City, Pa.

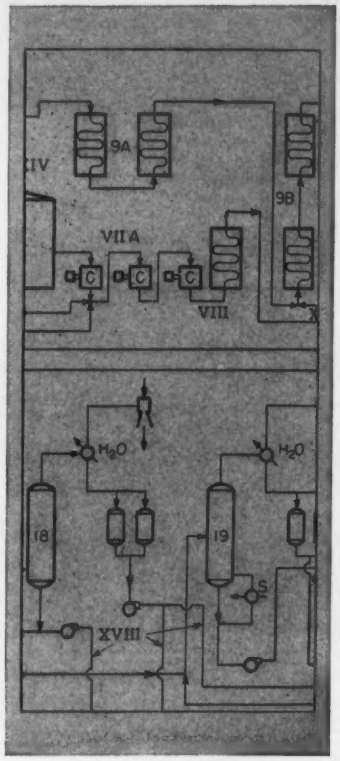
Check 2575 opposite last page.

Truck comparison chart permits potential purchasers of low-lift and high-lift electric "walkie" material handling truck to impartially evaluate different makes and models. Chart lists some 30 different points of comparison for both types of electrically powered trucks. Comparison Chart — Lewis-Shepard Products, Inc., 125 Walnut St., Watertown 72, Mass.

Check 2576 opposite last page.

Packaged steam generator design and construction are discussed in 20-page catalog. Two-drum, water-walled units for oil-gas-coal firing are completely described in Cat SB57E — Erie City Iron Works, Erie, Pa.

Check 2577 opposite last page.



Large chemical process equipment

designed and built by Dravo's experienced team of engineers and production men, can often mean large dollar savings to your company. Dravo's know-how in custom-built equipment can help you reduce costs through use of large, efficient processing units.

Find out how this service can add dividends to your processing equipment investment. Contact Process Equipment Department, Dravo Corporation, Pittsburgh 25, Pa.

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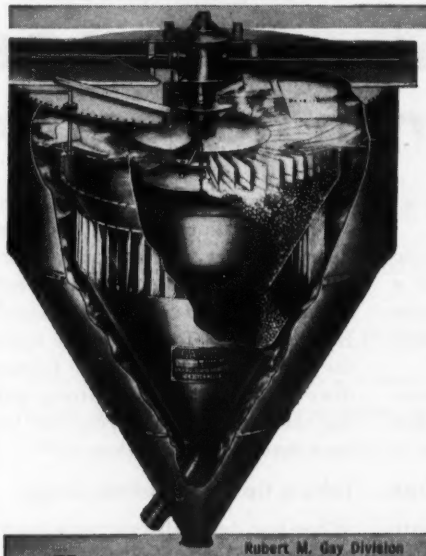
GAYCO
CENTRIFUGAL AIR SEPARATORS



Classify practically all dry fine materials

You get:
- CLOSER SEPARATIONS
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- NO UNDESIRABLE OVERSIZE.

RANGE 60 to 400 mesh. Timken bearings. Choice of Standard or Heavy Duty Models.

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Check 2579 opposite last page

New blower...its cast Inconel hub takes stresses of 3500 RPM spin in hot corrosives

It spins at 3500 RPM in a fiery, corrosive-gas-laden environment.

That's why this new blower, made by Buffalo Forge Company for a major chemical producer, is made of Inconel* nickel-chromium alloy parts.

Inconel alloy provides a high combination of strength and corrosion resistance at high temperatures.

Inco foundry casts critical hub

Buffalo Forge took no chances with the most critical part in the blower. To be *sure* that exacting specifications were met, they had the makers of Inconel alloy make the hub casting. As long-term customers of Inco's Bayonne, N. J. foundry, they knew they could depend on Inco to produce a sound, uniformly strong casting; one that would bring out the best that was in the alloy.

Take a tip from Buffalo forge...

When you design for extreme conditions, consider the properties of Inconel alloy. And, if the part is to be cast, call on Inco to cast it.

A 9-page Inco technical bulletin, "Engineering Properties of Cast Inconel Alloys", gives the data you need... compositions, physical properties, machining procedures, and much more. We'll be more than glad to send you a copy. *Registered trademark

The International Nickel Company, Inc.
67 Wall Street New York 5, N.Y.

INCO TRADE MARK

INCO-CAST PRODUCTS

Check 2580 opposite last page

NEW LITERATURE

Plastics products made from Teflon, Raylon, and Kel-F are covered in 32-page catalog. Specifications for packings, gaskets, joints, and couplings of Teflon are listed. Data on Kel-F products and properties are also provided. Form 8700 — Plastics Products Div., Raybestos-Manhattan, Inc., Manheim, Pa.

Check 2581 opposite last page.

Enclosed conveyor for bulk material handling, featuring two-direction chain, is covered in brochure containing nine information sheets. Photographs, layouts, capacities, and descriptive material are included. Bul TV-80 — Prab Conveyors, Inc., 30121 Groesbeck Hwy., Roseville, Mich.

Check 2582 opposite last page.

Adipic acid — Bulletin of 36 pages of basic data for researcher includes physical properties, chemical properties and reactions, and suggested uses. Included is a list of 271 literature references and a "family tree" diagraming basic reactions of adipic acid. Tech Bul I-12R — National Aniline Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

Check 2583 opposite last page.

Heaters for batch heating applications in the chemical and petrochemical industries, as well as in the processing of oils, resins, varnishes, and inks are described in "Heat Processing Batch Liquids" — Selas Corporation of America, Dresher, Pa.

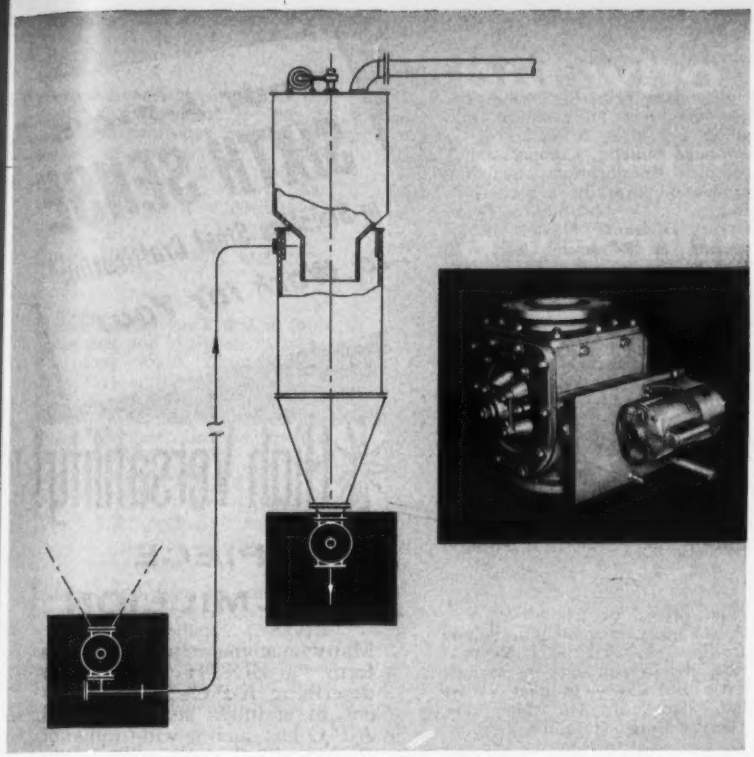
Check 2665 opposite last page.

Pellet cooler, dryer — Operation of compact rotary pellet cooler and dryer with built-in pneumatic conveying system is described in 2-page bulletin. Typical system layout with approximate dimensions and equipment involved is included. Bul 202 — Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.

Check 2584 opposite last page.

Pipeline sampling methods — Precise, automatic methods of sampling directly from pipelines are described in eight-page bulletin. Containing photographs and schematic drawings, bulletin describes technical aspects such as line stratification, flow profile, sample probe location, and economic factors. Tech Bul SM 9475-2 — Proportioneers, Inc., div. of B-I-F Industries, Inc., 345 Harris Ave., Providence, R.I.

Check 2585 opposite last page.



Put This ROTARY FEEDER in Your System and End Production Headaches

Are you experiencing the *usual* headaches connected with the *usual* rotary feeder installation? Problems like . . .

- Irregular feed
- Flooding during feeding
- Leakage of feed, due to wear
- High maintenance costs
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Solving these problems is easy—just *specify an A-S-H Type "B" Rotary Feeder.*

The A-S-H Type "B" Rotary Feeder was engineered to meet your needs. Our exclusive rotor and shoe design guarantees positive feed without flooding, adjusts easily for wear and can be replaced without dismantling piping. Data Sheet DVc shows how this is done, and how the Type "B" will solve other rotary feeder headaches. Send for your copy today.

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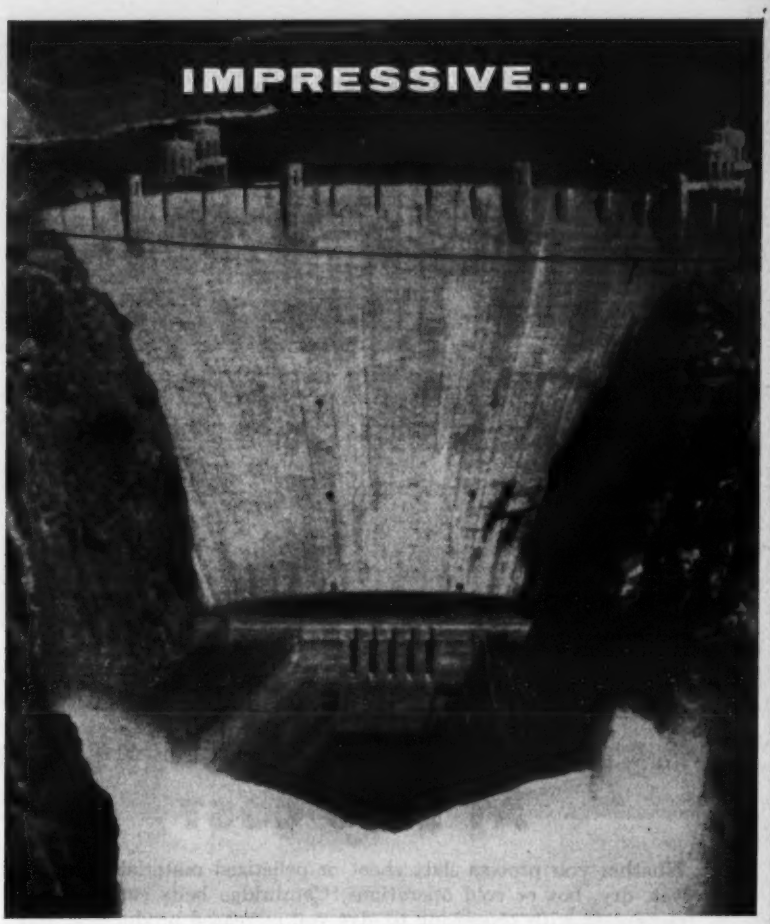
MATERIALS HANDLING EQUIPMENT

Check 2586 opposite last page



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proven performance in industry

For over 20 years the operation of Hoover Dam has compiled an impressive record of controlling floods, conserving irrigation water and supplying hydroelectric power.

For over 75 years, Deming Pumps have been noted for their *impressive performance* record in handling a wide variety of liquids for diversified industrial applications. The complete line of Deming Pumps provides more than 10,000 types, sizes and capacities to meet any industrial requirement.

Depend on Deming . . . write for complete information.

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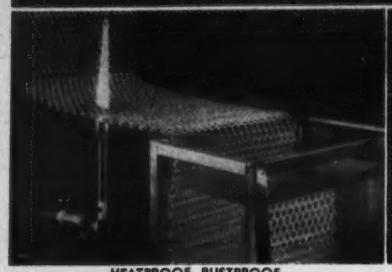
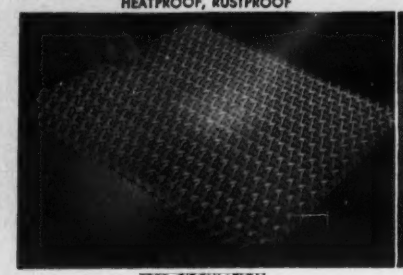
Cambridge WOVEN WIRE BELTS



HEATPROOF, RUSTPROOF

FLASH DRAINAGE



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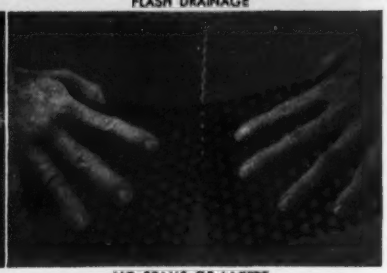

NO SEAMS OR LACERS

METAL-MESH BELTS GIVE FAST, UNIFORM PROCESSING AT LESS COST

Whether you process slab, sheet or pelletized materials through wet, dry, hot or cold operations, Cambridge belts can combine movement with processing to give you increased production, and higher product uniformity at lower operating costs. Here's how:

CONTINUOUSLY MOVING BELTS ELIMINATE BATCH PROCESSING—give faster, less costly production; reduce slow, costly manual handling.

OPEN MESH PROVIDES FREE AIR, LIQUID CIRCULATION—atmospheres and solutions circulate through the belt and around product for fast, uniform processing, flash drainage. Close mesh can't mar or mark soft slab or sheet products.

ALL-METAL CONSTRUCTION IS HEATPROOF, COLDPROOF, RUSTPROOF—Cambridge Belts can be woven from any metal or alloy to take up to 2100° F. or sub-zero temperatures, yet remain impervious to attack from water, acids or caustic solutions.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges and cross flights to keep product on belt during movement.

Currently, Cambridge Belts are used in the chemical industry for such diversified operations as bagging cement, drying wool, cooling and drying polyethylene sheets, washing, rinsing and drying catalysts, tanning hides, drying coal, and processing rubber.

Talk to your Cambridge Field Engineer soon. He'll recommend the belt size, mesh or weave—in the metal or alloy best suited to your operations. You'll find his name in the classified phone book under "BELTING-MECHANICAL". Or, write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

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OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Check 2588 opposite last page

NEW LITERATURE

Utility spray dryer for drying various materials in chemical and allied industries is described in two-page bulletin. Compact unit's complete specifications, including production capacity are cited in Bul 235 — Necro-Niro Spray Dryer Division, Nichols Engineering & Research Corp., 70 Pine St., New York 5, New York.

Check 2589 opposite last page.

Electron microscope is discussed in 6-page folder containing engineering information and technical data. Text covers construction details, electron optical system, condenser lens and so forth. File S-633 is issued by Instruments Div., Philips Electronics, Inc., 750 S. Fulton Ave., Mount Vernon, N.Y.

Check 2590 opposite last page.

Float valves for liquid-level control in large or small installations are illustrated in bulletin that provides details and data on various types. Bul 254 — Klipfel Valves Inc., Div. of The Hamilton-Thomas Corp., Hamilton, Ohio.

Check 2354 opposite last page.

Overhead conveyors — Catalog of 44 pages, containing ten pages of installation photos, describes overhead conveyor. Information is complete enough to engineer one of these overhead conveyors of any size. Cat CDA — Conveyor Div., The American Mono-Rail Co., 4th & Franklin Sts., Tipp City, Ohio.

Check 2591 opposite last page.

Crotonic acid, its properties, reactions, and applications, are described in eight-page bulletin that includes comprehensive bibliography. Bul TDR A-101—Eastman Chemical Products, Inc., subs. of Eastman Kodak Co., Kingsport, Tenn.

Check 2592 opposite last page.

Automatic blending scale for proportioning various grades of free-running materials is described and illustrated in Data Sheet 5802 — Richardson Scale Company, Clifton, N. J.

Check 2593 opposite last page.

Industrial television, including five basic suggestions for equipment selection, is described in 12-page bulletin. Case histories of successful operations are detailed. Bul 2239 — Electronics Div., Diamond Power Specialty Corp., Box 415, Lancaster, Ohio.

Check 2594 opposite last page.

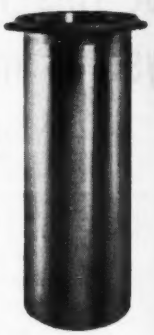
PUT A-P-C'S SIXTH SENSE in Stainless Steel Craftication* to Work for You!

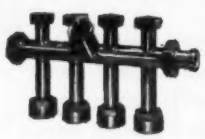
High Versatility!

ONE PIECE OR A MILLION

Many customers have used the term "a SIXTH SENSE" in describing A-P-C's unusual talent in stainless steel . . . And A-P-C has such a wide range of equipment — such great versatility in production *that one piece or a million are welcomed.*

Typical deep draw from one piece





Complicated tubular fabrication

High production runs for parts

Deep, unbelievably deep and complex draws . . . unusual, A-P-C designed automatic heliarc welding machines . . . extensive machining facilities . . . and 29 years of experience in a wide range of products and components are ready to go to work for you.

Craftication is our term for fabrication by A-P-C's skilled craftsmen

ALLOY PRODUCTS CORP.

1075 Perkins Avenue
Waukesha, Wisconsin

Check 2595 opposite last page

Protective coatings — epoxy, polyurethane, and furane — are described in four-page bulletin. Resistance of each type to a variety of corrosives is given. Bul on coatings — Furane Plastics, Inc., 4516 Brazil St., Los Angeles 39, Calif.

Check 2596 opposite last page.

Electric tiering truck that is four-directional and designed to transport long loads through wide main aisle and move sideways in a narrow storage aisle is described in two-page bulletin which includes specifications and applications. Bul 846 — The Raymond Corporation, 63-168 Madison St., Greene, N.Y.

Check 2597 opposite last page.

Stainless steel pipe, fully annealed, for corrosion-resistant applications is subject of bulletin. Complete information on solving tube problems is provided in Bul TB410 — Tubular Products Div., The Babcock & Wilcox Company, Beaver Falls, Pa.

Check 2368 opposite last page.

Hammermill screen change instantly from floor above is possible by device described in manufacturer's bulletin which contains complete specifications. Bul HW 458 — Schutte Pulverizer Co., Inc., 878 Bailey Ave., Buffalo 6, New York.

Check 2598 opposite last page.

Cellular concrete products are discussed in 8-page bulletin that briefly describes process, lists technical characteristics and possible uses. Features such as nailability, workability, and strength are pointed out. Cellular concrete products Bul — Calsi-Crete, Inc., Subsidiary of Continental Materials Corp., 6306 N. Cicero Ave., Chicago 46, Ill.

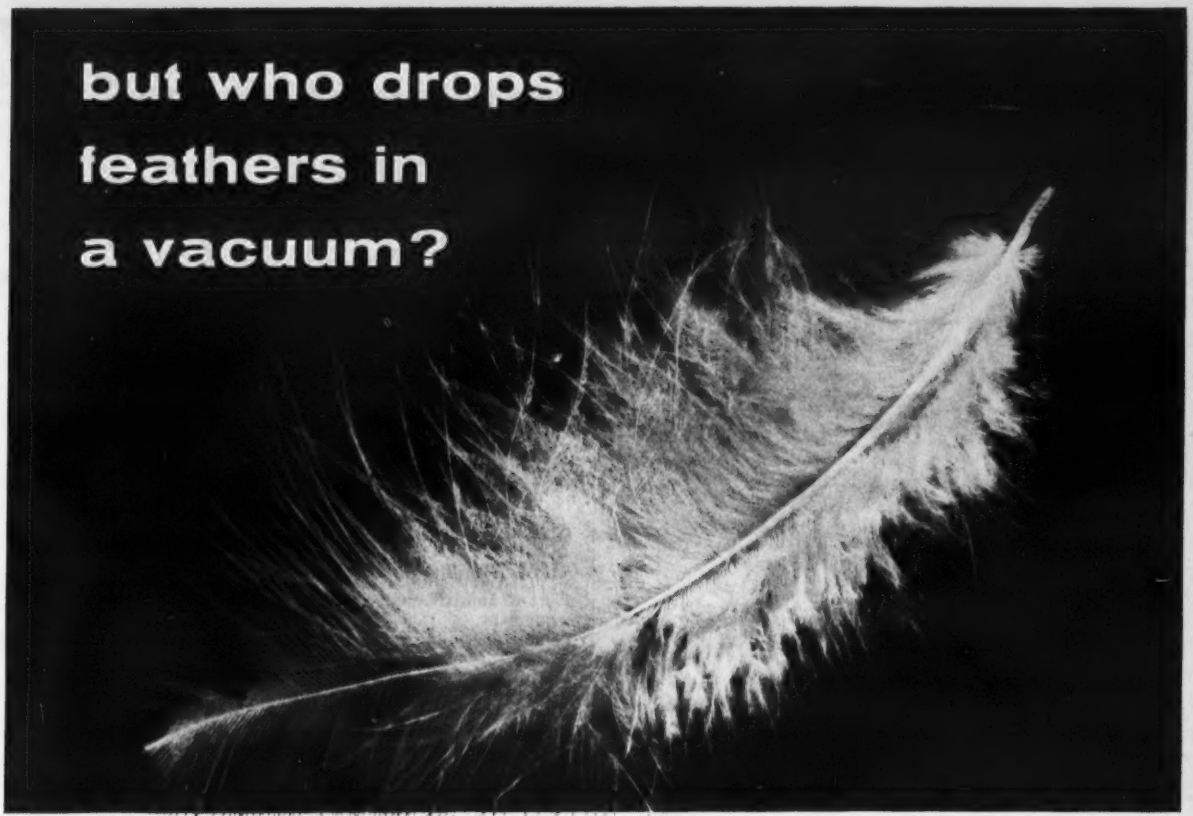
Check 2599 opposite last page.

Hydraulic tube fittings — Catalog of 28 pages contains complete information on design and installation of manufacturer's line of hydraulic tube fittings. Cat 556 — Flodar Corporation, 16911 St. Clair Avenue, Cleveland 10, Ohio.

Check 2600 opposite last page.

Case-marking and coding attachment, friction-type, is detailed in four-page bulletin containing illustrations, description, and complete specifications. Bul "ROL-3" — Adolph Gottscho Inc., Hillside 5, N. J.

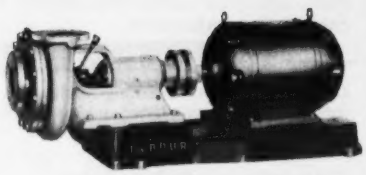
Check 2601 opposite last page.

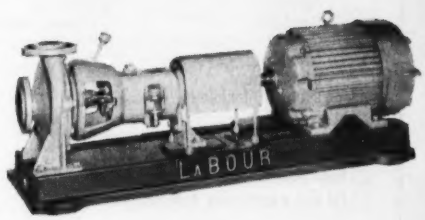


In a perfect vacuum, a feather is supposed to drop at the same speed as a chunk of lead. Nobody, so far as we know, has actually tried to produce a perfect vacuum in apparatus suitable for such an experiment. In the work-a-day world, the lead beats the feathers to the bottom every time.

There are theories about pump performance, too—sound theories, demonstrable in any laboratory. In the work-a-day world of the chemical plant, however, it's *actual* performance, not theoretical, that earns a profit. And that's where LaBour has been consistently on top for more than 35 years —and still is.

Most pump service per dollar cost—that's the way to measure pump value. If you want to see proof of LaBour superiority on this basis, we'll be delighted to provide it for you. Just drop us a line.





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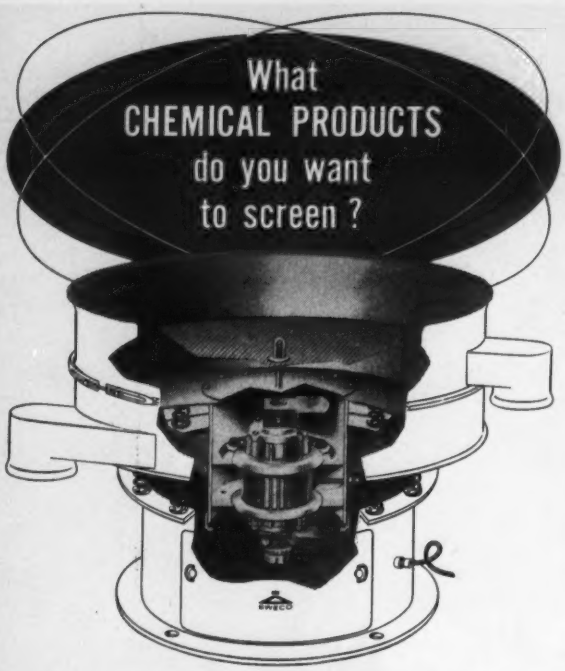
LABOUR

THE LaBOUR COMPANY, INC. • ELKHART, INDIANA, U. S. A.

Check 2602 opposite last page



You can screen them better with a SWECO Vibrating Screen Separator. More than 550 SWECO Separators are performing efficient screening operations today in chemical plants throughout the world. Advantages include: big capacity – clean separation – long screen life – low operating and upkeep cost. So, whether the chemical materials you wish to screen are wet or dry – coarse or fine – heavy or light, you should investigate the SWECO Separator now.

SEND FOR SCREENING DATA

Check the kind of screening application in which you're interested. If it isn't listed, add it in the space provided. We can send you specific information on your screening problem or one very similar.

☐ I'm interested in screening data on:

☐ Abrasives	☐ Fertilizers
☐ Adhesives	☐ Inorganic Chemicals
☐ Alkalies	☐ Minerals
☐ Catalysts	☐ Organic Chemicals
☐ Cement	☐ Paints
☐ Ceramics	☐ Plastics
☐ Detergents	☐ Rubber
☐ Drugs & Medicines	☐ Salt

☐ Other _____

☐ Send new SWECO Separator Catalog
☐ Send bulletin on "Solids-Liquid Separation"
☐ I'd like a screening demonstration

YOUR NAME _____

COMPANY _____

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CITY _____ ZONE ____ STATE _____

Clip and mail to Dept. S-212-3

SWECO SEPARATORS

Southwestern Engineering Company

4800 Santa Fe Avenue, Los Angeles 58, California

Engineers and Constructors . . . Manufacturers

Check 2603 opposite last page

NEW LITERATURE

Butterfly valves, rubber seated, are described in 4-page bulletin that provides features, dimensions, operation, and technical characteristics. Especially useful is handy sizing nomograph. Bul 650-R2 — Builders-Providence, Inc., Division of B-I-F Industries, Inc., 345 Harris Ave., Providence 1, R. I.

Check 2604 opposite last page.

Additive designed specifically for pulp and paper mill operations is described in information sheet which tells how to use it and how much to use. Product is "instant" antifoam in concentrated flake form. WR-301 Info Sheet — Hodag Chemical Corp., 7247 N. Central Park, Chicago 45, Ill.

Check 2605 opposite last page.

Use of antioxidants to retard development of rancidity in edible animal fats is discussed in 12-page bulletin. Methods of application, test methods for evaluation of effectiveness, suggested concentrations, and limitations and labelling requirements are covered. Bul G-105—Eastman Chemical Products Inc., subs. of Eastman Kodak Company, Kingsport, Tenn.

Check 2606 opposite last page.

Polyester molding compound in variety of colors brings readers' attention up sharply through use of colored photographs in eight-page brochure. Suggested molding equipment, compression molding pressures, closed mold technique pressures, preforming and preheating among subjects discussed. Bul D 200 — Hooker Chemical Corporation, Box 344, Niagara Falls, New York.

Check 2607 opposite last page.

"Oh I see . . . 'Physical Constance' is just your nickname . . ."

if it's done better with spray nozzles–

better best

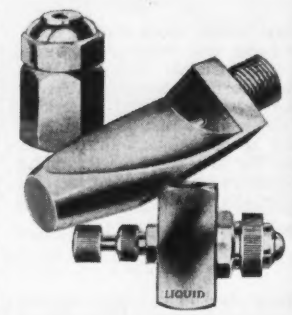
it will be done **best** with SPRAYING SYSTEMS CO.

SPRAY NOZZLES

HERE'S WHY:

1. You have a complete choice of **design types** to give the exact spray characteristics required.
2. You have thousands of **capacities** to choose from . . . for more exact volume control.
3. You have a complete choice of **materials** for chemical compatibility.

Your inquiry is invited.



SPRAYING SYSTEMS CO.
3216 Randolph Street
Bellwood, Ill.

For complete spray nozzle information write for Catalog 24.

Check 2608 opposite last page

Protects Metals Against Hot Acids, Acid and Sulfurous Fumes, Salt Spray Steam, Mild Alkalies Up to 600° F.

Markal "D-A" Coatings will protect metal against any corrosive action. It is an ideal product for ore sintering plants, plating plants, food plants, lumber kilns, foundries, chemical plants, sewage disposal plants, laundries, heat exchangers . . . many others.

Markal "D-A" Coatings are applied by brush or spray and can be air dried or baked. The Coatings will withstand temperatures up to 600°F.

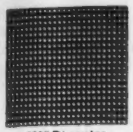
For free sample write on company letterhead, stating temperature extremes, surface temperature at time of application, and corrosive condition.

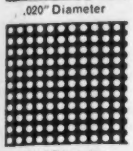
Other Markal Coatings are available in a complete range of types for any condition and temperatures up to 2200°F. Send for catalog No. MPC. The **Markal Company,** 3055 West Carroll Avenue, Chicago 12, Illinois, telephone Sacramento 2-6085

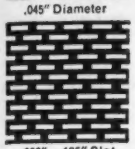
Check 2609 opposite last page

H&K Perforated Screens

for Grading Sieving Dewatering Filtering Straining • Sterilizing and Tote Baskets


.020" Diameter


.045" Diameter


.028" x .125" Slot

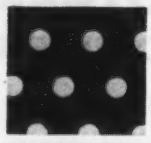
FIND NEAREST H&K AGENT IN THE 'Yellow Pages'

Listed Under "Perforated Metals"

H&K perforated screens are furnished, to customer order, with holes accurate and uniform in size, shape and spacing. The screen resists blinding as burr-free holes are slightly larger at the bottom. H&K perforated screens can be furnished with margins or unperforated areas in practically any material desired.

H&K specializes in the perforating of stainless steel, monel and other corrosion-resistant alloys.

Contact either H&K office or an H&K agent. Let us work with you on your perforated screen requirements.


Tapered Round Holes in Steel


No. 3 Diagonal Slot

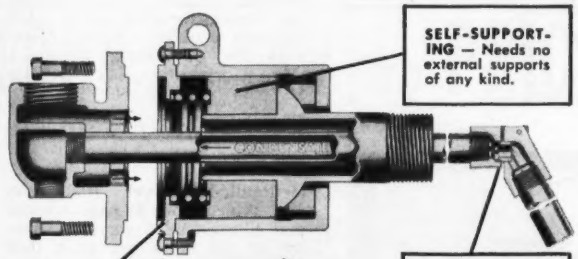
Write for H&K General Catalog

THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse
5636 Fillmore St., Chicago 44

New York Office and Warehouse
110 Liberty St., New York, N. Y.

Check 2610 opposite last page



Johnson Rotary Joint with SYPHON ELBOW

Johnson Joints represent the best way industry has yet found to get steam or liquids into rotating rolls and cylinders. They are completely packless, need no lubrication or adjustment. The Type SBP shown gets steam in, condensate out, through the same head. Other types available for through flow service, in sizes to meet all operating needs. ***WRITE FOR COMPLETE INFORMATION.***

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

Check 2611 opposite last page

NEW LITERATURE

Ceramic binder and plasticizer described in 12-page, pocket-size fact book which relates uses, applications and performance data on this chemically active material. Book points out that binder and plasticizer achieves benefits in ceramics by combination of surface activity and colloidal action in clay-water system. Entitled "Polyfon," book is available on postcard or letterhead request from Polychemicals Div., West Virginia Pulp & Paper Company, Charleston A, S.C.

Aluminum casters for lightweight, heavy-duty trucks are described in two-page bulletin which points out features and includes specifications. Bul 253 — M. Neushul Co., Inc., 1852 East Pacific Coast Hwy., Wilmington, Calif.

Check 2612 opposite last page.

Machining titanium is discussed in eight-page brochure of fundamentals, machinability, and basic requirements. Separate pages give suggested speeds, feeds, and tool angles on turning, milling, drilling, tapping, grinding, and reaming. Data are included on cutting tool for each type of titanium or alloy being machined. "Machining Recommendations for Titanium" — Mallory-Sharon Metals Corp., Niles, Ohio.

Check 2613 opposite last page.

Piston rings of 100% nylon composition are described in company bulletin. Available in sizes, types, and textures to fit particular equipment, rings are for reciprocating pumps, hydraulic controls, and air cylinders. Bul 5503 — Darling Valve & Manufacturing Co., Williamsport 4, Pa.

Check 2313 opposite last page.

Chemical feeding systems nomograph has been developed to enable chemical engineers to calculate correct sizes in a matter of a few seconds. Nomograph for sizing chemical feeding systems — Milton Roy Company, 1300 East Mermaid Lane, Philadelphia 18, Pennsylvania.

Check 2614 opposite last page.

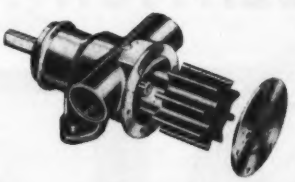
Ion exchange plant operation, including design data is described in 12-page bulletin that also covers pilot plant tests and preliminary construction of full scale plant. Plant was designed and built to treat 3200 gpm of water for nuclear steam generators at 50 gpm per square feet. Reprint 88 — Infilco Inc., P. O. Box 5033, Tucson, Arizona.

Check 2615 opposite last page.

JABSCO SELF-PRIMING CHEMICAL TRANSFER PUMPS

Jabsco chemical pumps are widely used whereever liquids, semi-solids and slurries are transferred. From the West Virginia Pulp and Paper Company, Luke, Md., comes this factual report: "We find your pumps extremely useful for laboratory and pilot plant work. We have pumped water, caustic soda solutions up to 50%, various other chemical solutions, chalk and pigment slurries of high and low consistencies and pulp slurries up to 3% quite satisfactorily. The self-priming ability of the pumps makes the transferring of liquids from tank to tank a very simple operation as it is only necessary to switch the hose lines around as needed, no connections are needed to the tanks as the hoses are dropped in from the top."

Noel Obenshain, Research Engineer



Whether your pumping requirements are similar to Mr. Obenshain's, or quite different, chances are there's a Jabsco self-priming chemical transfer pump perfectly suited to your requirements. Jabsco chemical pumps are manufactured in stainless steel, plastic, bronze, and cast iron and feature Jabsco's heat and wear resistant neoprene impellers.

Get your copy of Jabsco's chemical resistance chart today. Call your Jabsco distributor (see the Yellow Pages) or write direct to:

JABSCO PUMP COMPANY
1485 Dale Way, Costa Mesa, Calif.

Gentlemen: Please send information on Jabsco self-priming chemical transfer pumps and the Jabsco Chemical Resistance Chart.

Name_____

Company_____

Street_____

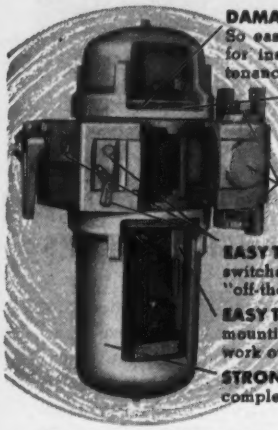
City_____ Zone____ State_____

Check 2616 opposite last page

NEW SPIN TOP ENCLOSURE FOR HAZARDOUS LOCATIONS

4 SIZES for Starters 0 thru 5

CLASS I, GROUP C and D • CLASS II, GROUP E, F, and G



DAMAGE-RESISTING Acme thread. So easy to put on and take off tanks for installation, inspection or maintenance.

REAL PROTECTION against rain, dust, dirt and weather because male threads on collar section engage female threads on tank.

INCREASED WIRING SPACE and through-feed conduit entrances for horizontal tap-offs.

EASY TO ADD pushbuttons or selector switches with easy-to-buy, easy-to-use, "off-the-shelf" parts kits.

EASY TO INSTALL • "Slide and Hook" mounting arrangement takes the hard work out of the installation job.

STRONG and LIGHTWEIGHT • The complete enclosure is cast aluminum.

Write for BULLETIN 9990. Square D Company, 4041 North Richards St., Milwaukee 12, Wis.

NOW...EC&M PRODUCTS ARE A PART OF THE SQUARE D LINE

SQUARE D COMPANY

Check 2617 opposite last page

for uniform results

in . . . **BAKING**
DRYING
CURING
DEHYDRATING

select

YOUNG BROTHERS OVENS and **DRYERS**

designed and built for individual product and process requirements

Batch and Conveyor Types up to 1000° F

Gas, Electric, Steam, Oil — Radio Frequency Power

Write for Bulletin 157

YOUNG BROTHERS CO.

1825 Columbus Road • Cleveland 13, Ohio

Over 60 years of service

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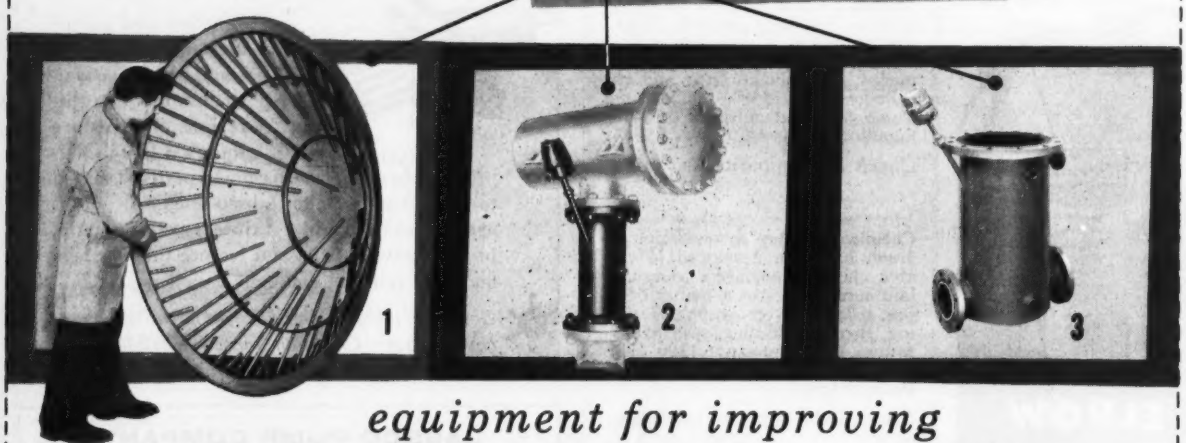
DISTILLATION exclusives!



equipment for improving

COLUMN PERFORMANCE *and* **CONTROL**

1. **LARGE SIZE REDISTRIBUTOR:** (now built in sizes up to 90") Collects and distributes liquid evenly over the packing, minimizes channeling and keeps packing wet and at maximum efficiency at all liquid rates. Especially suitable for vacuum distillation. Can be used with all types of packing and readily installed in any installation.

2. **AUTOMATIC REFLUX HEAD:** Explosion proof, electrically operated for high vacuum, pressure and temperature and for corrosive and hazardous service. Designed to handle both vapor and reflux at the top of distillation columns. Eliminate reflux control problems with its simple, accurate and dependable operation.

3. **AUTOMATIC REFLUX SPLITTER:** Similar to item #2 but designed for handling reflux only. Available as standard units with capacities up to 3000 gals. per hour. Larger and steam-jacketed units also available.

The above items are available in most materials of construction and in sizes 2" and larger.

ALSO AVAILABLE: Packing support plates, distributor plates, stills, columns, and complete distillation plants.

FURTHER INFORMATION AVAILABLE ON REQUEST

All items above are patented.

DISTILLATION ENGINEERING COMPANY 107 DORSA AVENUE, LIVINGSTON, N. J.

Check 2619 opposite last page

NEW LITERATURE

Hypalon coatings, modified with phenolic and epoxy, for lining tanks to be used for 73% caustic and other applications are described in four-page bulletin. Other lining materials are also covered. Bul 258 — Wisconsin Protective Coating Co., Green Bay, Wisc.

Check 2620 opposite last page.

Cleaning tool that propels solid jet of hot water at high pressure for cleaning equipment, even at long distances, is detailed in Bul 424A — Sellers Injector Corporation, 1600U Hamilton St., Philadelphia 30, Pa.

Check 2177 opposite last page.

Pipe fittings of ductile iron are detailed in illustrated eight-page catalog which includes types and sizes, applications, prices, safety factors, and service ratings as listed by Underwriters' Laboratories, Inc. Cat 2-PF — The Kuhns Brothers Company, 1800 McCall St., Dayton 2, Ohio.

Check 2621 opposite last page.

Tablet-binding and granulating with pharmaceutical grade of polyvinylpyrrolidone are covered in four-page booklet that details use in wet granulation, direct compression, slugging and encapsulating. Typical formulas are included. Plasdone booklet — Antara Chemicals Div. of General Aniline & Film Corporation, 435 Hudson St., New York 14, N. Y.

Check 2622 opposite last page.

Hydraulic-lift-truck attachments are subject of 48-page catalog that illustrates 26 ways for owners to get more use from their lift trucks. Cat 585 — Little Giant Products, Inc., 1514 N.E. Adams St., Peoria 3, Ill.

Check 2623 opposite last page.

Spiral rake thickener — Bulletin of eight pages provides dimensions, specifications, and distinctive features of improved thickener. Spiral rake moves solids to center discharge in one revolution. Bul T5-B6 — Denver Equipment Company, PO Box 5268, Denver 17, Colorado.

Check 2624 opposite last page.

Roller chain drive — Catalog of eight pages presents descriptive information, prices, and tabular data pertinent to line of roller chain drives. Cat D-58 — Information Div., Maurey Mfg. Corp., 2915 South Wabash Ave., Chicago 16, Ill.

Check 2625 opposite last page.

PUMP

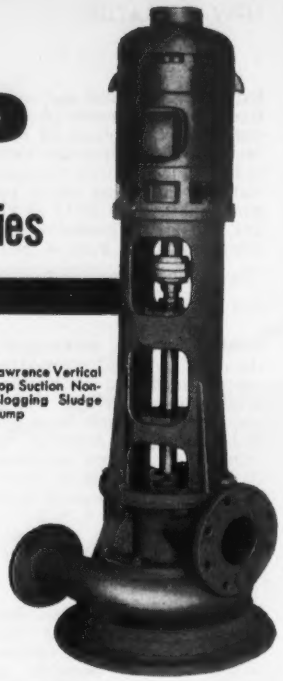
volatile sludges & slurries

WITH NO CLOGGING . . . large clearances through impeller and casing completely prevent clogging.

UNDER LOW NPSH . . . liberated gases and vapors are vented to suction tank or atmosphere.

WITHOUT GAS OR VAPOR BINDING . . . vertical top suction prevents binding.

Available in all metals and alloys. Write for Bulletin 206-4.



Lawrence Vertical Top Suction Non-Clogging Sludge Pump

LAWRENCE PUMPS INC.

371 Market Street, Lawrence, Mass.

Check 2626 opposite last page

LOOK *beyond the* PRICE TAG

For Further Information . . . on the complete line of Dura Seal mechanical seals write for Catalog 480- CP

DURAMETALLIC CORPORATION

KALAMAZOO MICHIGAN

Check 2627 opposite last page

FLETCHER *TORNADO*

THE CENTRIFUGAL WITH FULL AUTOMATION

Bottom Discharge Tri-Point Centrifugal

Bottom Discharge →

CUT PRODUCTION COSTS IN HALF — The Fletcher Tornado needs no operators. It's fully automatic, gives you 24-hour production. You're certain of quality control of your product because of the uniform load and the unvarying consistency. Compare these features.

Uni-Construction—Entire centrifugal—basket, curb, drive and accessories oscillate as a unit.

Bi-Ball Swivel — Dual ball and socket on each of the three steel balancing stands assure smooth oscillation.

Tri-Point Suspension—Scientifically positioned to provide positive, effortless balance of the entire centrifugal.

Also available in manual and semi-automatic models.
F/M variable drive • Zero to maximum RPM

The New Fletcher Works, Inc. CENTRIFUGAL DIVISION

2nd & Glenwood Avenue • Philadelphia 40, Pa.

Send me additional information on the Fletcher Tornado Centrifugal

NAME & TITLE

COMPANY

ADDRESS CITY & STATE

C-1

Check 2628 opposite last page

EASTERN PORTABLE MIXERS

especially designed for small batch processes

offer . . . precise mixing results with long term cost savings

Eastern Portable Mixers are especially designed for dependable, low cost service in small batch processes. Where fixed mounted installations are not required, Eastern's Portables offer greater versatility, ease of handling, and long term cost savings.

Speeds of 420, 1125, and 1725 R.P.M. rated from 1/20 to 3 H.P. are standard, with variable speed and air-driven models also available. Motors in all standard types can be supplied in semi-enclosed, totally-enclosed, or explosion-proof construction. Shafts and single or dual propellers are available in a choice of alloys for all service requirements. New optional ball-swivel clamp as illustrated, permits easy adjustment of mixer position in tank.

For a personalized analysis of your mixing problems, send details to Eastern engineers. A recommended solution will be furnished promptly and without obligation. For a helpful guide to mixing fundamentals, write for "Handbook of Fluid Mixing."

NEW PORTABLE MIXER BULLETIN

Eastern's improved line is included in the revised Portable Bulletin No. 530-A.

Eastern

EASTERN INDUSTRIES MIXER DIVISION

INDUSTRIES, INC.
MIXER DIVISION
Regent Street
East Norwalk, Conn.

Check 2629 opposite last page

NEW LITERATURE

External mechanical seal with seal faces located inside the pump stuffing box is subject of bulletin. Seal faces are adjustable externally by single set-screw arrangement without dismantling seal or pulling pump shaft. Bul CP551 — Chemical & Power Products, Inc., 9 Broadway, New York 4, N.Y.

Check 2389 opposite last page.

Flexible heat exchangers for chemical industry, claimed to be readily assembled to handle any combination of liquids and gases, are covered in eight-page bulletin that thoroughly describes design features for diverse applications. Bul 302.5K1 — Ross Heat Exchanger Div., American-Standard, Box 2081, Buffalo 5, N.Y.

Check 2630 opposite last page.

Swivel plate casters — Bulletin of two pages contains features and specifications of casters for trucks and all portable equipment loads up to 2000 lb. Bul 52658 — The Faultless Caster Corp., Evansville 7, Ind.

Check 2631 opposite last page.

Cement processing operations are described in 12-page fact file reprinted from technical report. How company rehabilitated its plant to achieve high cement capacity and greater fuel efficiency is discussed. Fact File ER-3241-2 — Fuller Company, Catasauqua, Pennsylvania.

Check 2632 opposite last page.

Air conditioning units are subject of 54-page bulletin which describes in detail such features as automatic air filter, and covers such aspects as selection, capacities, standard arrangements, dimensions, and suggested specifications. Bul 786 — American Air Filter Co., Inc., Dept. PD, 215 Central Ave., Louisville 8, Ky.

Check 2633 opposite last page.

Portable bagging scale designed for either power or gravity feed is described in illustrated data sheet. Specifications and line drawing showing dimensions are included in Product Data Sheet 5803 — Richardson Scale Co., Clifton, N.J.

Check 2634 opposite last page.

Proper plastic for specific corrosion problems and how to select it is discussed in eight-page bulletin. Bul C-15 — Haveg Industries, Inc., 900 Greenbank Rd., Wilmington 8, Dela.

Check 2635 opposite last page.

NOW

TUNGSTEN CARBIDE HARD FACING

with the METCO ThermoSpray Gun

Now you can apply coatings of this extremely hard material with the required concentration of carbide, to any desired thickness, with a low-cost installation in your own plant, or have it done at reasonable cost in a metallizing job shop.

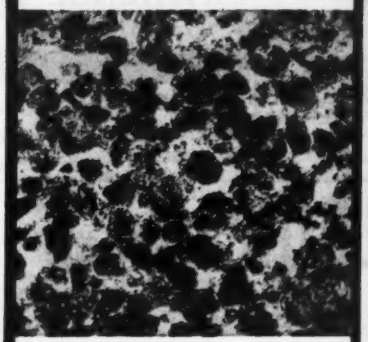


Photo-micrograph of sprayed coating, showing high tungsten carbide (dark particles) concentration. Mag. 50x – actual size of area shown, approx. .040" x .040". (Photo courtesy Sam Tour & Co., Inc.)

These coatings are non-porous, homogeneous, have very high tensile strength and provide excellent wear resistance under the most extreme service conditions.

For full details—write, wire or phone for Bulletin 139. No obligation, of course.

METCO

Metallizing Engineering Co., Inc.
1189 Prospect Ave., Westbury, Long Island, New York EDgewood 4-1300
In Great Britain: Metallizing Equipment Co., Ltd., Chobham near Woking, England

Check 2636 opposite last page

NEW LITERATURE

Carboys, gaskets, carboy caps, wire twisting tools, wire fasteners, and bottle stoppers are illustrated and specified in carboy and gasket bul — Superior Manufacturing Co., 13th & Rockland Sts., Philadelphia 41, Pa.

Check 2637 opposite last page.

Process equipment, including all types of manufacturer's glassed-steel and alloy vessels, is subject of 12-page Buyer's Guide. Bul 968 — The Pfaudler Co., Div. of Pfaudler Permutit, Inc., Rochester 3, N. Y.

Check 2638 opposite last page.

Accident prevention in small businesses lacking full-time safety specialists is aim of 93-page handbook. This second edition contains such new material as a description of radioactive hazards and ways to protect against them. "Handbook of Accident Prevention" — National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Products for plastic and other industries are briefly described in a 12-page bulletin which covers line of adhesives, coatings, anti-static agents, cleaners, lubricants, and related products. "Products for Plastic and Allied Industries" — Chemical Development Corporation, Danvers, Mass.

Check 2639 opposite last page.

Self-dumping hoppers are described in illustrated four-page bulletin which includes design and application information along with complete specifications. Self-dumping Hoppers Bul — Apex Welding & Fabricating Corporation, 30 Interstate St., Bedford, Ohio.

Check 2640 opposite last page.

Acrylic resin coated fabrics and laminates described in newly revised technical bulletin. Products comprise new family of materials primarily of interest for use in electrical insulation. "Lecton"— Fabrics and Finishes Dept., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.

Check 2641 opposite last page.

Beryllium-copper tubing of small diameter is described in six-page memorandum. Corrosion resistance and other physical properties are covered. Data Memo 7 — Superior Tube Co., Norristown, Pa.

Check 2642 opposite last page.

with the Curtiss-Wright
GAMMAGAGE

Algoma Ore Properties, Ltd. uses this modern radiation gage to control its separator medium

Prior to the installation of a Curtiss-Wright Gammagage, Algoma depended on hand sampling to measure the gravity of their ferrosilicon medium in their sink float plant. Personal errors, and delay in sampling and measurement, did not permit adequate control of the medium.

After installation of the Gammagage on the medium return line from the screen drain, the operator could read the density of the medium at a glance and make immediate adjustments to maintain a constant separator density. This improved efficiency and reduced ore losses. Said Mr. Ferguson, Superintendent of their Sink Float Plant: "We are satisfied that the unit does an excellent job in measuring the S. G. of our medium."

The versatile Gammagage can also be used to measure specific gravity of classifier overflows, thickener underflows, feed to cyclone classifiers and many other mill slurries. The measurement signal can be used to operate a recorder or a controller with air or electric output to automatically control dilution valves, pump speeds or pump strokes.

Let us show you how the Density Gammagage can improve the efficiency of your operation.

WRITE FOR DESCRIPTIVE LITERATURE

Industrial Controls Department

ELECTRONICS DIVISION

CURTISS-WRIGHT

CORPORATION • CARLSTADT, N. J.

Check 2643 opposite last page

modern magic lantern . . .

he's using MICROCARDS*

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Write today for more information: What's now available on MICROCARDS, where you can get your own material converted to MICROCARD FORM.

Check 2644 opposite last page

NEW LITERATURE

Safety code handbook outlines various procedures for maintaining, protecting, recharging, and inspecting fire extinguishing equipment commonly used throughout the chemical industry. Handbook of 42 pages presents both mandatory and recommended procedures to assure long life and efficient service from this equipment. "FEMA Handbook of Safety Codes" — Fire Equipment Manufacturers' Association, Inc., One Gateway Center, Pittsburgh 22, Pa.

Check 2645 opposite last page.

Highlights of the first 50 yrs of the American Institute of Chemical Engineers are described in 188-page hard-cover book published by the Institute. Publication has 16 chapters and covers in detail the origin of the society, its growth, and activities. To obtain "Highlights . . . The First Fifty Years," remit $5.00 direct to the American Institute of Chemical Engineers, 25 West 45th Street, New York, New York.

Persulfates that have particular values in processes involving emulsion polymerization of monomers and depolymerization of organic polymers, and in such applications as processing color films, etching printing plates, and modifying starches, and as reactive oxidizing agents for other purposes, are covered in series of company bulletins. Information on how processing techniques can be improved through use of persulfates can be obtained from Buls 34, 63, 68, and 90 — Becco Chemical Div., Food Machinery and Chemical Corporation, Station B, Buffalo 7, N.Y.

Check 2234 opposite last page.

Cycloidal blowers for vacuum service are covered in 14-page bulletin which presents detailed design and construction data as an aid to proper application of this equipment. Full-color cutaway view of blower clearly shows design features. Bul VP-158 — Roots-Connersville Blower, Div. of Dresser Industries, Inc., 900 W. Mount St., Connersville, Ind.

Check 2646 opposite last page.

Vibrating screen separators, 18, 30, and 48″ sizes, are described in 20-page catalog. Operating, application, and specification data on screening all types of dry materials and separation of solids from liquids are presented. Included is a list of approximately 250 products that have been satisfactorily screened by this equipment. Bul S-581 — Southwestern Engineering Co., Dept. 410, 4800 Santa Fe Ave., Los Angeles 58, Calif.

Check 2647 opposite last page.

METERING PUMPS

- STAINLESS STEEL — OILLESS BEARINGS — STERILIZABLE
- POSITIVE DISPLACEMENT — SMOOTH, NON-PULSATING FLOW
- FOR HOT, COLD, VISCOUS OR WATERY FLUIDS
- ACCURATE WITHIN 1 TO 2%

Maisch Metering Pumps are simple in design, ruggedly built for long service, and can be depended on to maintain accuracy indefinitely. Exclusive design features insure optimum performance. Particularly suited for handling chemicals, syrups, oils, glue, processing solutions, etc. Quick demountable or fixed heads. Fixed capacity pumps available in wide range of output. Pumps in stock for immediate delivery. Write for complete details and prices.

MECHANICAL PRODUCTS CORPORATION
176 North Ogden Avenue • Chicago 7, Illinois

Check 2648 opposite last page

Same formula as famous Kroil that has pleased 14,000 industrial users for 10 years or more.

Loosens stuck together metal parts, bushings, bearings, bolts, screws, pipe, etc., "anything from an embalmer's needle to a bulldozer," one customer said.

"Like an extra employee," said another. "Turned rust into mush, put $50,000 equipment back to work."

You too can get these results.

Try Aerokroil at our risk. Send $2 cash, and we'll pay postage.

KANO LABS. 1051 S. Thompson Lane Nashville 11, Tenn.

Check 2649 opposite last page

NEW LITERATURE

Positive ion accelerators are described in six-page bulletin which includes graphs showing neutron yields and energies, discussion of applications in fields of chemical analysis, nuclear chemistry and engineering. "Cockcroft-Walton Accelerators for Nuclear Chemistry and Chemical Analysis"— Applied Radiation Corporation, Walnut Creek, Calif.

Check 2650 opposite last page.

Expansion joint catalog of 80 pages includes information for rating expansion joints subjected to axial or lateral movement, changes in rotation or combinations of these movements, together with formulae and tables for calculating forces and/or bending movements developed in connected piping or equipment. Dimension and weight tables for joints from 3 to 72 inches in diameter are included. Cat EJC-581 — Badger Manufacturing Co., 230 Bent St., Cambridge, Mass.

Check 2651 opposite last page.

U. S. Sewage Works, statistical summary, is subject of Public Health Service report. Report discloses that in 1957, 11,131 communities had sewer systems serving 98.4 million persons — increases of over 2200 communities and 24 million persons since 1945. Publication 609 — Water Supply and Water Pollution Control Program, Public Health Service, Department of Health, Education, and Welfare, Washington 25, District of Columbia.

Homogenizer and dispenser is covered in 4-page bulletin that describes the principle of operation and points out features. Range of applications is also listed. Homogenizer Bul — Bronwill Scientific Division, Will Corporation, P. O. Box 127, Brighton Station, Rochester 10, N. Y.

Check 2652 opposite last page.

Protective coatings of a number of different types are discussed in data sheets, along with chemical resistance of each and suggested applications. Protective coatings folders — Bisonite Company, Inc., PO Box 84, Kenmore Station, Buffalo 17, N. Y.

Check 2653 opposite last page

Plastic bottle in steel drum for shipment of corrosive chemicals is illustrated and specified in four-page bulletin AD-236 — Jones & Laughlin Steel Corp., Container Division, 405 Lexington Ave., New York 17, N. Y.

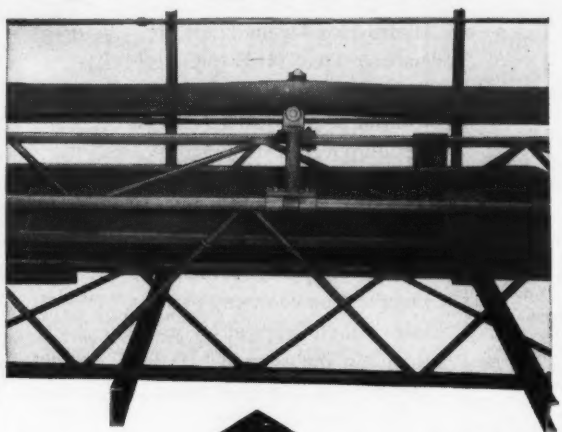
Check 2654 opposite last page.

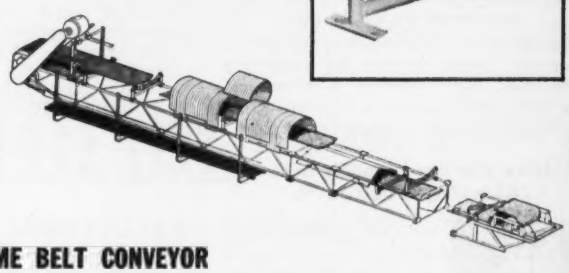
NEW BELT CONVEYORS from JOY

handle sticky materials without buildup on rolls

JOY LIMBEROLLER BELT CONVEYOR IDLERS ARE SELF CLEANING

Operating on a completely new principle, the Limberoller is a flexible steel cable suspended between two bearings. Neoprene discs are molded to the cable, forming a single roll idler that turns on its own axis. This turning results in a unique flexing action that cleans off triple superphosphate, ammonium sulphate, and sticky chemicals. The natural curve supports the belt throughout its entire width . . . eliminates spillage. WRITE FOR BULLETIN 191-ACF.





JOY READY-SPAN PIPE FRAME BELT CONVEYOR

A new, pre-fabricated package unit . . . made of standard pipe-truss frames in sections of various lengths . . . easily combined at job site. All accessories, idlers, walkways, cover decking, hoods and supports clamp to pipe for location anywhere on frame without burning or drilling of holes. Variety of drives, takeups, pulleys, motor mounts, wipers, hold-back brakes; all fit same units. All components promptly available from stock to meet almost any material or handling condition.

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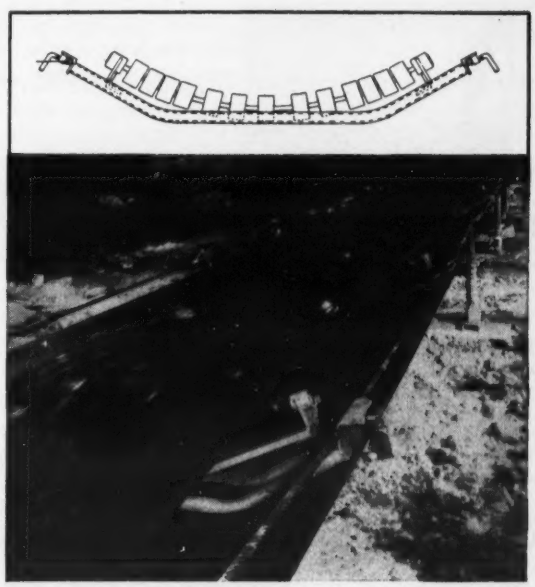


JOY LIMBEROPE ROPE BELT CONVEYOR

Consists of two parallel steel wire ropes stretched between two anchoring points. Joy Limberoller idlers, in special brackets, are mounted between wire ropes. Support stands are arranged under wire ropes to hold them at proper level. As load comes on belt, ropes "give," resulting in excellent troughing, less spillage. Low initial cost and simple, fast installation.

Plus a complete line of drives, pulleys, takeups . . . everything for efficient bulk handling

WSW L 6773-191

JOY

Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

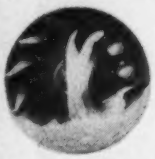
Check 2655 opposite last page

Highly Intimate Blends in 1 to 2 Minutes

Blends while discharging; No segregation or flotation

Sturtevant Rotary Blenders start 4-way blending while charging, continue it during discharge, thus producing highly intimate, even blends of dry and semi-dry materials – within 3 to 5 minutes of start of charging.

Six *complete* blending cycles per hour are common. And Sturtevant's special action produces no particle reduction, cleavage or attritional heat – is highly effective yet gentle and safe even with explosives.



Receiving

Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way right from start of charging.

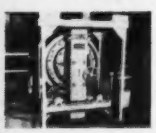
Discharging

Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

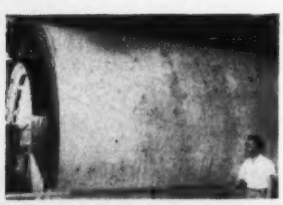
Self-cleaning, dust-sealed drum; one-man accessibility

Operation of Sturtevant Blenders is self-cleaning – drum interiors are completely dust-sealed. For inspection of all models, one man simply loosens a few lugs to remove manhole cover – quickly and easily.

Nine standard models with capacities to 900 cu. ft.



10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.



One of four 450 cu. ft. Sturtevant Blenders at Celriver Plant of Celanese Corp. (Rock Hill, N. C.). These large units handle up to 20,000 lbs. batches — have a 9-year record of meeting the most exacting blending requirements.

Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs – can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (Bulletins also available on Mixers, Air Separators, Micronizers, Crushers and Grinders.) Write today. STURTEVANT MILL CO., 119 Clayton St., Boston, Mass.

Check 2656 opposite last page

NEW LITERATURE

Tachometers and speed indicators of a wide variety are treated in 20-page bulletin. Units described include chronometric, centrifugal, resonant reed. Bul 35 — James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa.

Check 2657 opposite last page.

Platform scales, portable type, are detailed in four-page bulletin which describes construction features, gives specifications, and lists capacities. Portable Platform Scale Bul — Detecto Scales, Inc., 540 Park Ave., Brooklyn 5, N.Y.

Check 2658 opposite last page.

Conical dryer-blender made of corrosion-resistant glassed-steel is covered in four-page bulletin. Bul 963 — The Pfaudler Co., div. of Pfaudler Permutit Inc., Rochester 3, N. Y.

Check 2659 opposite last page.

Seamless metal cans for storing, packaging, sampling, shipping, and dispensing are illustrated and described in bulletin which charts capacities and dimensions. Product Memo 111 — George D. Ellis & Sons, Inc., American & Luzerne Sts., Philadelphia 40, Pa.

Check 2660 opposite last page.

Homogenizers are described in 12-page bulletin that also details operations of single-stage and two-stage homogenizing valves. Dimension tables, drawings, and specs are included in Bul 6-552 — Cherry-Burrell Corp., 2400 Sixth St., S. W., Cedar Rapids, Iowa.

Check 2661 opposite last page.

Gas purification process is treated in six-page bulletin which outlines performance data and typical industrial applications. Basic flow diagram of process is included. Gas purification process bul — Girdler Construction Division of Chemetron Corporation, Louisville 1, Ky.

Check 2662 opposite last page.

Plant maintenance and engineering is subject of ninth volume in a series that reports proceedings of Plant Maintenance & Engineering Conference. Cloth-bound 211-page "Techniques of Plant Maintenance & Engineering — 1958" may be obtained by remitting $10 direct to Clapp & Poliak, Inc., 341 Madison Ave., New York 17, New York.

new STRONG

ductile iron steam traps give you cast steel service at less than half the price!*

Strong's new 540 series Hydro-Flex Steam Traps are made of DUCTILE (NODULAR) Iron that can be bent or twisted without breaking. This newest metallurgical development, adopted by ASME*, enables Strong to produce traps for service up to 500 psi and 650°F with ample safety factor. Ductile Iron economy permits sale of these traps at less than half the price of comparable cast steel traps.

*Ductile (Nodular) Iron meets the requirements of the ASME Code for use in vessels at pressures to 1000 psi and temperatures to 650°F (80% of cast steel service).

1. **Safer to use** because Ductile Iron body and cover will bend or twist in case of explosion or fire whereas brittle materials might shatter or break.

2. **Especially recommended** for drainage and drip service on high pressure steam systems and on both high and low pressure systems in chemical plants and refineries where steel is normally required.

3. **Wide choice of sizes and capacities:** Pipe sizes from ½" to 2", capacities to 42,800 pounds of water per hour.

4. **Connections:** Traps with screwed connections regularly furnished. (Although Ductile Iron can be welded or brazed under controlled shop conditions, welding is *not* recommended for field fabrication.)

Strong 540 Series Ductile Iron Traps are available from your local Strong Distributor. Call him for more information, or contact . . .

4/S

STRONG, CARLISLE & HAMMOND

508 SANDUSKY STREET • CONNEAUT, OHIO

air traps • strainers • reducing valves • vacuum or pumping traps

continuous blowdown valves • separators • engine stops • F and T traps

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- **AUTOMATIC TEMPERATURE CONTROL TO ±2°F.** *at the heater*—your assurance of dependable process heat of up to 600°F. for uniform product quality—without elaborate secondary controls. Heater responds instantly to changing load demands.
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Get the facts about Aroclor and International-LaMont Aroclor Heaters—designed specifically for dependable, economical generation of high temperature process heat. Write today for Bulletin No. 1300.

*AROCLOR is a registered trade name of the MONSANTO CHEMICAL COMPANY.

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Steel Firebox Heating & Power Boilers Low & High Pressure Water Tube Package Boilers • International-LaMont Forced Recirculation Generators • ASME Code Pressure Vessels & Welded Products.

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"SELAS Gradiation® Heating gives us easy, accurate temperature control"

...reports Baltimore Paint and Color Works

Selas Gradiation heating delivers ultra-favorable temperature control in the production of paints, varnishes, enamels and specialized industrial finishes at Baltimore Paint and Color Works. Compared with other methods of heating synthetic resins, oleoresinous varnishes and processed oils, Gradiation heating gives low initial and operating costs . . . high safety factor with its explosion-proof design . . . batch flexibility . . . uniform heating which produces consistent high clarity.

The same control in uniformity of heat application and adherence to critical programming requirements are important considerations in all Selas batch heating applications . . . in the chemical and petrochemical industry as well as in the processing of oils, resins, varnishes and inks.

Fast, radiant gas heating, rapid burner response and turndown ratios of 15:1 or more, make Selas Gradiation heating versatile as well as controllable, enable it to meet any time-temperature cycle within 2°F . . . and duplicate it, batch after batch.

Learn why more than 600 paint, varnish and chemical manufacturers use Selas Gradiation heating. Write today for Bulletin "Heat Processing Batch Liquids." Address Dept. 1511.

Gradiation is a registered trade name of Selas Corporation of America.

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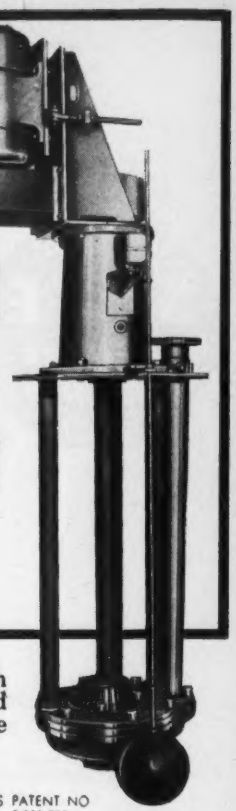
YOU **SUMP** IT!
WE **PUMP** IT!



The Galigher Company's vast experience in pumping and their knowledge of abrasion and corrosion proofing has enabled them to solve serious material handling problems.

U.S PATENT NO 2,808,782

PROBLEM:
To handle a corrosive slurry containing phosphoric acid, sulfuric acid, kerosene, amines and chlorides in the solvent extraction process at uranium ore concentration mills.

SOLUTION:
Acidproofiing the Galigher Sump Pump with a protective coat of POLYVINYL CHLORIDE (PVC).

RESULTS: Outstanding success under these extreme conditions resulted in a completely satisfactory pumping operation. Therefore, similar Galigher Sump Pumps have been specified for use in other uranium mills.

Galigher Sump Pumps are also available in the following materials of construction:

- Rubber Covered
- Neoprene Covered
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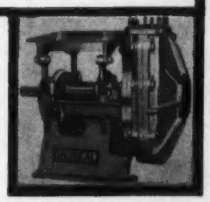
- Ni-Hard



THE VACSEAL PUMP
Precision engineered for rugged use. Exclusive impeller design eliminates gland water.

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SP508

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ONLY SICON "takes" the 550°F. temperature reached in sections of this Preway heater grille.

ONLY SICON protects this "Direction Flo-Grille" where temperatures often reach above 500°F.

EVEN A HOT **550°F.** *can't faze the finish* when it's

Sicon®

SILICONE

HEAT RESISTANT FINISH

The upper grille of the famous PREWAY heater often reaches a surface temperature of 550°F. Here, the use of an organic finish was found to require raising grille to protect lower part. But in tests SICON protected so well that re-design proved unnecessary. SICON in smart decorative colors can protect your product too—and save money besides! Write for proof.

Write for copy of SICON Brochure.

MIDLAND *Industrial Finishes Co.*

DEPT. K-3, WAUKEGAN, ILLINOIS

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Flexrock Teflon* Packing no. 405

Constructed of fine Teflon fibers tightly braided over a resilient core of glass fiber and impregnated with Teflon. Flexrock 405 is an excellent chemical packing. it is especially recommended for use against concentrated acids such as sulphuric, nitric, sodium hydroxide; alkalies, etc. Flexrock 405 Teflon Packing has a maximum temperature range of 500°F., and comes in sizes of 1/16" to 1". Smaller sizes available with solid core.

*DuPont's trade name for tetrafluoroethylene

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that's interesting

Thought-provoking slants on projects and products

Air-cushioned ride on rough terrain

Unique cargo transport, developed by Albee Rolligon Company of California and known as the "Arc", can carry a seven-ton payload over rocks, swampland, brush, sand, and snow as efficiently as an ordinary truck rolling along a modern highway.

Secret of Arc's rugged maneuverability is its use of six huge pneumatic bags in place of conventional wheels. Bags are friction-driven from above by rollers.

Another important factor is Arc's weight-saving glass-fiber-reinforced plastic cab made with isophthalic-based polyester resin. Plastic cab is strong and durable, yet weighs only 450 lb. Total weight of truck is only 7000 lb. Top speed is 50 mph.

Sapphire poppet more efficient

Relief valve, built by Whittaker Controls Div. of Telecomputing Corp., uses sapphire ball as valve poppet. Valve assembly was designed to relieve pressure from tank of space vehicle. In operation it will be required to withstand frequent severe shock while maintaining a very low leakage over a wide temperature range.

Sapphire ball, manufactured by Linde Company, Div. of Union Carbide Corp., was chosen for this critical application because of its polished surface and ability to withstand continual hammering against a hard metal seat.

Leak Lock* STOPS LEAKS *where other compounds fail!

Here's a simple, economical solution to many troublesome leaking joint problems. Leak Lock holds LP, gasoline, oils, gases, petro-chemicals and refrigerants that eat through ordinary joint compounds. It's remarkably tough, highly adhesive, remains flexible indefinitely . . . the joint compound that stretches rather than breaks. Years of use have established its advantages in stopping wasteful or hazardous leaks in the petroleum, chemical, atomic energy, electronic, refrigeration and other fields.

Approval by Underwriters' Laboratories for Gas and Oil Equipment List: Also for Propane and Butane.

FREE SAMPLE—Leak Lock is available in handy tubes and in cans. Write on your letterhead for sample tube.

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16 Colfax Avenue • Clifton, N. J.

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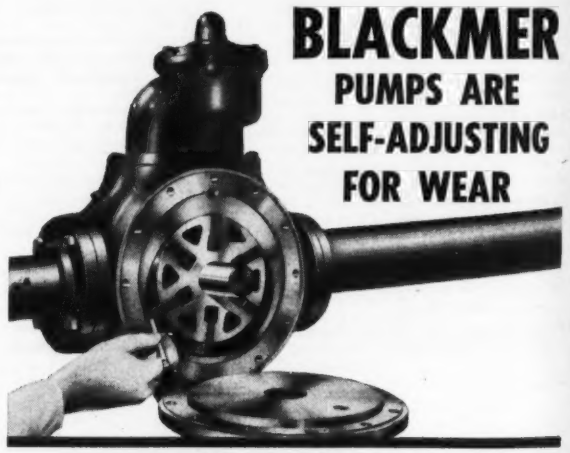

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. . . . with the efficient sliding vane design

As wear occurs at the tips of these vanes, they move further out of the rotor slots to compensate for the wear. High pump efficiency is sustained until vanes are worn to the critical point. Even then they can be replaced easily and inexpensively. For more information, write for Bulletin One.

"liquid materials handling"® equipment

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See Yellow pages for your local sales representative

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Key No.	Description

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See additional numbers on reverse side

READER SERVICE SLIP Continued from reverse side of this sheet **NOVEMBER 1958**

☐ 2437	☐ 2477	☐ 2517	☐ 2557	☐ 2597	☐ 2637
☐ 2438	☐ 2478*	☐ 2518	☐ 2558	☐ 2598	☐ 2638
☐ 2439	☐ 2479	☐ 2519	☐ 2559	☐ 2599	☐ 2639
☐ 2440	☐ 2480	☐ 2520	☐ 2560	☐ 2600	☐ 2640
☐ 2441	☐ 2481	☐ 2521	☐ 2561	☐ 2601	☐ 2641
☐ 2442	☐ 2482	☐ 2522	☐ 2562	☐ 2602	☐ 2642
☐ 2443	☐ 2483	☐ 2523	☐ 2563	☐ 2603*	☐ 2643
☐ 2444	☐ 2484	☐ 2524	☐ 2564	☐ 2604	☐ 2644
☐ 2445	☐ 2485	☐ 2525	☐ 2565	☐ 2605	☐ 2645
☐ 2446	☐ 2486	☐ 2526	☐ 2566*	☐ 2606	☐ 2646
☐ 2447	☐ 2487	☐ 2527	☐ 2567	☐ 2607	☐ 2647
☐ 2448*	☐ 2488	☐ 2528	☐ 2568	☐ 2608	☐ 2648
☐ 2449	☐ 2489	☐ 2529	☐ 2569	☐ 2609	☐ 2649
☐ 2450	☐ 2490	☐ 2530*	☐ 2570	☐ 2610	☐ 2650
☐ 2451	☐ 2491	☐ 2531	☐ 2571	☐ 2611	☐ 2651
☐ 2452	☐ 2492	☐ 2532	☐ 2572	☐ 2612	☐ 2652
☐ 2453	☐ 2493	☐ 2533	☐ 2573	☐ 2613	☐ 2653
☐ 2454	☐ 2494	☐ 2534	☐ 2574	☐ 2614	☐ 2654
☐ 2455	☐ 2495	☐ 2535	☐ 2575	☐ 2615	☐ 2655*
☐ 2456	☐ 2496	☐ 2536	☐ 2576	☐ 2616	☐ 2656
☐ 2457	☐ 2497*	☐ 2537*	☐ 2577	☐ 2617	☐ 2657
☐ 2458	☐ 2498	☐ 2538	☐ 2578	☐ 2618	☐ 2658
☐ 2459	☐ 2499	☐ 2539	☐ 2579	☐ 2619*	☐ 2659
☐ 2460	☐ 2500*	☐ 2540	☐ 2580	☐ 2620	☐ 2660
☐ 2461	☐ 2501	☐ 2541	☐ 2581	☐ 2621	☐ 2661
☐ 2462	☐ 2502	☐ 2542	☐ 2582	☐ 2622	☐ 2662
☐ 2463	☐ 2503	☐ 2543	☐ 2583	☐ 2623	☐ 2663
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☐ 2465	☐ 2505	☐ 2545	☐ 2585	☐ 2625	☐ 2665
☐ 2466	☐ 2506	☐ 2546	☐ 2586	☐ 2626	☐ 2666
☐ 2467	☐ 2507	☐ 2547	☐ 2587	☐ 2627	☐ 2667
☐ 2468*	☐ 2508	☐ 2548	☐ 2588	☐ 2628	☐ 2668
☐ 2469	☐ 2509	☐ 2549	☐ 2589	☐ 2629	☐ 2669
☐ 2470	☐ 2510*	☐ 2550	☐ 2590	☐ 2630	☐ 2670
☐ 2471	☐ 2511	☐ 2551	☐ 2591	☐ 2631	☐ 2671
☐ 2472	☐ 2512*	☐ 2552	☐ 2592	☐ 2632	☐ 2672
☐ 2473	☐ 2513	☐ 2553	☐ 2593	☐ 2633	
☐ 2474	☐ 2514	☐ 2554	☐ 2594	☐ 2634	
☐ 2475	☐ 2515	☐ 2555	☐ 2595	☐ 2635	
☐ 2476	☐ 2516	☐ 2556	☐ 2596	☐ 2636	

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Key No.	Description

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Floating bearings

Bearing lubrication by air and other gases (neon, helium) is becoming more common. Instead of oil, bearings are floated on thin layer of air or other gases either by injecting high-pressure gas around bearing or running it against wall of air its rapid spin builds up. (*Industrial Research Newsletter*, Armour Research Foundation)

No-sperm worm (fly)

Fifty million radioactively sterilized screwworm flies were turned loose against the prolific of their species in a screwworm eradication campaign this fall. Big "fifth-column" effort is joint undertaking of southeastern states and USDA, and covers almost 75,000 sq mi, including all of peninsular Florida. (*Agricultural Research*, USDA)

For more information on product at right, specify 2671 see information request blank opposite last page.

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DRYERS

Parallel and counter-flow; direct, indirect, and indirect-direct heat designs for the accurate and controlled drying of a wide variety of powdery, crystalline or heat sensitive chemical salts, plastics, ores, pharmaceuticals, foods, fertilizers, clays, sand and other materials. Sizes to 120″ in dia. x 100 ft. long.

Stainless Steel Dryer with Steam Heated Air Processing a Corrosive Chemical Salt.

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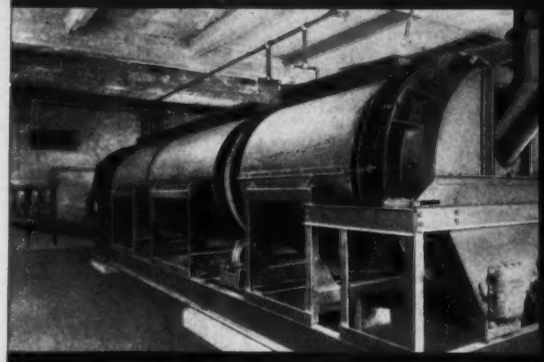
Two types. The air coolers cascade the material through a cooling air stream. Water type coolers (the water applied externally to cool the metal which in turn cools the material) are used for cooling dusty or powdery materials, or if cooling in a special atmosphere is desirable. Wide range of sizes.



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Gas fired or electrically heated, continuous, combination calciners and coolers for heating metal oxides, chemical salts, carbonaceous materials, ores, and other materials to 2000° F. in an oxidizing, inert or reducing atmosphere, and cooling them to 150° to 200° F. before discharging. Wide range of capacities.

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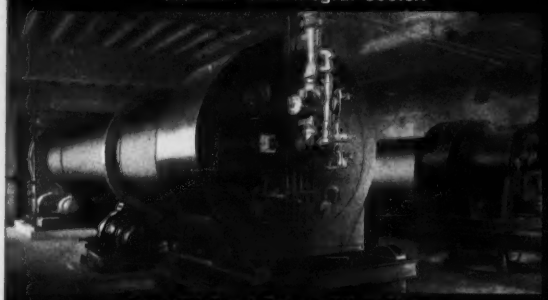
For calcining ores, crystalline chemical salts, petroleum coke, applying ceramic coatings to granulated materials, and performing other oxidizing or reducing operations. Temperatures to 2300° F. Parallel or counter-flow operation. Sizes to 120″ in dia. x 110 ft. long.



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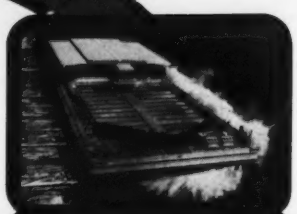

Typical audience reactions:

Bishop, Tex.—"Planning fair-sized test after seeing this film."

Louisville, Ky.—"Answers many questions. Second showing arranged."

Cincinnati, Ohio—"Key personnel evidenced considerable interest."

Netherlands Antilles—"Both shows led to 45-minute discussions."

Fairport, Ohio—"Very interesting. Will try methods shown."

Las Piedras, Venezuela—"Putting ideas to work in near future."

Bartlesville, Okla.—"Viewed by 42 key men from five divisions."

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What produces electrolytic corrosion?

What factors favor hot-dip galvanizing?

How important is surface preparation?

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113

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